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By-Van Campen, Joseph A.

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A Stanford University project in which mathematical learning theory was applied to the learning of Russian in a first-year, computer-based college course is examined in this report. Included in the description of this project, designed to complete and implement the first-year Russian course, are the research and curriculum potentials of computer-based instruction, specific methods and techniques employed in conducting the experiment, and an analysis of the research findings. The bulk of the report appears in the form of appendixes which give examples of computer input codes, descriptions of the computer system, statistics on enrollment, lengthy tables of student responses, final examination results, an outline of grammatical points covered, and samples of the daily student summary sheets. (CW)

Final Report

Contract OEC-0-8-001209-1806

Project for Application of Mathematical Learning Theory to Second-language Acquisition, with Particular Reference to Russian

Joseph A. Van Campen

Stanford University

Stanford, California 94305

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Summary

The primary object of this project was to complete and implement a computer-based course in first-year college Russian. Such a course, consisting of some 135 computer-based sessions, was indeed completed and constituted a part of the offerings of the Slavic Department at Stanford University during the academic year 1967-68. The computer-based course was taken on a regular credit basis by Stanford students, and both the midterm and the final examinations for each of the three academic quarters were largely or, in the case of the spring final, totally identical with the examinations taken by students in Stanford's regular first-year Russian course.

The availability of daily reports on the progress of individual students enabled the principal investigator to obtain immediate feedback on the effectiveness of various instructional techniques and to discard those which seemed less useful. The cumulative result of this experience was a set of principles regarding the optimal utilization of the computer in foreign-language instruction.

As the year progressed, the type of instruction was changed from a simple linear program to one permitting the use of human-generated remedial branching. Plans were laid and largely implemented for a more sophisticated type of instructional program in which machine-generated remedial branching would be used to permit almost unlimited possibilities for individual instruction.

A vast amount of data on student performance was collected, reduced to a usable form, and subjected to a preliminary analysis with regard to certain questions of general interest.

After the completion of the academic year, the course was revised in accordance with the principles mentioned above.

Chapter 1

Introduction

The main subject of this report is the computer-based course in first-year college Russian written by the principal investigator and implemented at the Institute for Mathematical Studies in the Social Sciences at Stanford University. Since computer-based courses of this type have not, to our knowledge, been available up to now, it may be well to say a few words about the exact nature of our undertaking.

1.1. "Computer-based" as Opposed to "Computer-assisted" Instruction

Perhaps the most important feature of the course was that it was not "computer-assisted," but "computer-based." While the former type of instruction uses the computer to supplement or reinforce skills taught by a classroom teacher, the latter relies solely on the computer to convey information to the student. In the Stanford computer-based course, no classroom instructors were used for the acquisition of reading, writing, or aural comprehension skills, although written homework and language-laboratory drills were corrected by a research associate and returned to the students. No classroom instruction was given in pronunciation, although the students did make short recordings of their own speech which were evaluated for them in private interviews with a native Russian. Even in this case, no new information was "taught" by the evaluator.

1.2. Computer-based Instruction as a Tool for the Teaching of Foreign Languages

The learning of a foreign language differs from the attainment of many other skills, in that it entails the memorization of a very large number of items many of which are essentially independent of one another. Thus, the fact that the Russian word for "table" is stol is in no way derivable from the fact that the word for "chair" is stul. Again, the fact that the ending of the masculine past of Russian verbs is -l-, is in no way predictable from the fact that the ending of the first person singular of the present tense is -u-.

It follows that the student of a foreign language may fail to handle a given task successfully for a large number of reasons, some of which have nothing to do with the material he is currently studying. Thus, a student studying the accusative case who is called upon to translate "He is reading a book" may fail not only because he does not know how to generate the accusative of "book," but because he does not know the Russian word for "book," or because he does not know one or more of the words or forms needed to generate the rest of the sentence. This problem may be dealt with in a number of ways. Either the task to be performed may be kept so simple as to vastly reduce the possible sources of error, or, if a more complex response is demanded, the true source of any given error can be traced and remedied. Classroom instruction in a foreign language is in general not congenial to the second approach. Thus, form and pattern drills are much more suited to classroom use than the detailed analysis of

a single long sentence. Indeed, the overly detailed treatment of a long response made by a single student is generally regarded as bad for the morale of other students.

However, even the use of relatively simple drill responses in the classroom entails problems, since a student who has responded satisfactorily in a drill of a given type cannot proceed independently to new responses; he must wait for the drill to end.

Computer-based language instruction makes possible both the detailed remedial analysis of long responses and the adaptation of drill material to meet the needs of the individual student. By the end of the implementation of our first-year course, we were able to branch students to remedial drills if they failed to handle relatively simple items. A program has been developed now which generates a detailed set of "remedial" branches designed to ascertain which factor or factors underlie failure in the case of a complex response. Once the cause of the failure has been determined, the student can be branched to the appropriate drill, either immediately or during a later computer-based session.

Other features of computer-based instruction of relevance to foreign-language teaching include the large number of overt responses made by the student during a session, the immediate and personalized correction of errors in most such responses, and the absence of exposure to errors by other students. Even in a relatively small language class of, for example, eight students, the maximum average "solo" overt response time per student during a 50-minute session cannot be more than 6-1/4 minutes. In practice it is much lower. During a computer-based session of equal length, the student is responding overtly during a much larger period. Indeed, in some review sessions, our students made over 200 teletype responses to as many different stimuli in a single session. While the average classroom overt-response time can be increased by such group activities as saying sentences in unison or taking down dictation, these techniques do not readily lend themselves to the immediate correction of errors made by individual students. Thus, it is difficult to detect, much less to remedy, all the individual deviations from the correct response which occur when even as few as four people recite a sentence simultaneously. On the other hand, in the case of most classroom dictation, the correction of responses by the teacher takes place, if at all, only after an entire set of sentences has been transcribed and handed in by the student.

In our computer-based sessions all audio responses required of the student were followed by the playing of the correct response from the tape. In the case of teletype responses, active evaluation by the computer began within a few milliseconds of the completion of the response. In no case was the student able to proceed to a new response before being made aware of the adequacy of his performance on the preceding one.

While spoken responses could not be evaluated and corrected by the computer, computer-based sessions differed from the classroom situation in that the students were not exposed to the errors of other students. Our students heard only correct Russian spoken by a native speaker. Perhaps as

a result of this feature, tape recordings of passages read by the computer-based group revealed relatively few pronunciation errors.

1.3. Research Possibilities

One of the most important features of computer-based instruction is the possibility of obtaining detailed data on student responses. In the case of the Russian course, such data were collected, processed, and subjected to a preliminary analysis. While the in-depth exploration of this material is largely a matter for future research, it is already clear that the collection of such data makes possible research which would not be otherwise feasible.

1.4. Curriculum Improvement

Another area in which data on student performance can be useful is the evaluation and revision of the curriculum. New approaches can be readily tested and, if necessary, discarded or modified. The facility with which such changes can be achieved made possible the introduction of significant modifications in our Russian lessons throughout the course of the entire academic year. While the classroom teacher must generally continue to employ his textbook throughout an entire course, even though he has found it unsatisfactory, the structure and content of a computer-based course can be improved on a day-to-day basis.

Chapter 2

Methods

2.1. The Students

The participants in the computer-based course were drawn from students who reported to the sectioning meeting for first-year Russian held on the first day of classes of the Stanford fall quarter in September, 1967. The students were informed that a computer-based version of the course was available, and the first 30 students who signed up were admitted to the "computer section." No selectional criteria were employed and no detailed information was gathered on the make-up of either the computer-based or the regular sections. However, it should perhaps be noted that over half of the students who eventually registered for the regular sections had expressed a desire to enroll in the computer-based section.

2.2. The Physical Framework

The computer-based sessions took place in a special classroom at the Institute in Casita Hall on the Stanford campus. During these sessions each student received coordinated audio and visual stimuli. The latter were provided by one of six Model-35 teletypes capable of printing both English and Russian texts, but having only a Russian keyboard. Audio stimuli came from a set of headphones connected to an Ampex tape player (one for each teletype) which, like the teletype, was controlled by the central processor. Thus, while the student could both listen to and read either Russian or English material, he could type only in Russian. Furthermore, only typed responses could be evaluated for accuracy by the computer. In the case of spoken responses, the student had to rely on a comparison of his own response with the correct answer given on the audio tape.

The only other item in the computer-based classroom which was regularly used by the students was a set of numbered slots--one for each student--from which the students obtained their summary sheets and both new and corrected homework assignments, and in which they deposited homework for correction.

While a proctor was regularly present during all sessions, his only function was to hang and rewind audio tapes and to report any technical difficulties to the central processing staff.

(Students using the facilities of the Stanford language laboratory for dictation and comprehension drills did so in much the same manner as students from the regular language courses. A master tape was played at hourly intervals to which students listened with laboratory earphones.)

2.3. The Underlying System

The material for the computer-based sessions was typed, corrected, and converted to machine-run-code on one of the 12 Philco display consoles at the Institute's Computer-based Laboratory. The amount of typing to enter material was greatly reduced by the use of special input coding and a preprocessor program which used the coding to generate all the redundant portions of a given frame type. A complete listing of the most recent version of our input coding, along with examples of raw and processed input, is given in Appendix 1. A discussion of the program for the generation of the machine-run code and for the control of the teletypes and tape players is given in Appendix 2, which also contains a brief outline of the entire supporting system.

2.4. Classroom Scheduling

The day following the sectioning meeting referred to in 2.1. above was devoted to arranging individual student schedules. Each student was scheduled for five computer-based sessions per week (i.e., one session per day, Monday through Friday). This schedule paralleled the class meetings of the regular sections. Students were urged to schedule all of their sessions for the same hour, but in a few cases were allowed to choose one hour for their Monday, Wednesday, Friday sessions, and another for Tuesday and Thursday.

In the fall quarter, sessions were scheduled to begin 15 minutes after the hour from 1:15 p.m. through 5:15 p.m. No students were scheduled between 6:15 p.m. and 7:15 p.m., but students were regularly scheduled for 7:15 p.m. In addition, students who had missed or failed a session were allowed to sign up for make-up sessions at 8:15 p.m. or on Saturday mornings. This schedule was also followed for the second term. In the third quarter, make-up sessions were scheduled for 12:15 p.m., and the evening and Saturday sessions were dropped--a change made possible by a decrease in student enrollment to 24 (see Appendix 3, Table 1).

Normally, only five students were regularly scheduled for a given hour on a given weekday. This allowed us to keep one instructional station as a backup station in case another station needed repairs or readjustments. However, non-scheduled students were allowed to use the sixth station for make-up sessions, if it was not needed by regularly scheduled students.

2.5. Student-computer Interaction

2.5.1. Presentation of Material

Throughout the course, the presentation of material to students remained essentially the same: English or Russian material was typed by the teletype or played by the tape player. However, it should be noted that the first lessons contained a much larger amount of English audio material than did the following ones. Eventually no English material was

used on the tapes at all. In addition, as the students' knowledge of Russian increased, standard instructions, such as "listen," "repeat," and "type in Russian," were given in Russian instead of English.

2.5.2. Response Evaluation

During the first quarter, the evaluation and correction of typed responses was handled in a manner which differed radically from that used in the succeeding quarters. In the fall quarter, each character typed by the student was immediately checked with the corresponding character of the correct response. As soon as a deviation occurred, the computer took control of the teletype away from the student, informed him that he had made an error, and either told him to try again or provided the correct response, or both. This type of "immediate correction" proved unsatisfactory--primarily because no distinction was made between a genuine mistake and a typing error. As a result, students were under considerable pressure while typing a response and tended to become irritated when they committed an unintentional error.

The beginning of the winter quarter saw the implementation of a new correction routine which stores the characters typed by the student in a special response buffer until he strikes a special "terminator" key. The evaluation of the response begins only after the character corresponding to this key is received by the computer. Typing errors noticed by the student before the terminator is typed can be corrected in one of two ways: either the entire contents of the response buffer can be eliminated by typing a "line feed" (this permits the student to retype his response from the start); or, if the error is located not far from the last character typed, any number of characters, beginning with the last, may be deleted from the response buffer by typing a corresponding number of "underlines." These characters can then be replaced by the correct ones.

This approach to error correction proved highly satisfactory. As the data show (see Appendices 4, 5, 6), the overall percentage of correct responses was markedly lower for the first quarter than for the second and third quarters. Since there were no significant differences in the format of the lessons, one can at least conjecture that a sizable percentage of the "errors" recorded for the first quarter's work were typing errors.

2.5.3. Branching

During much of the first quarter, the computer-based sessions were simply linear programs through which each student proceeded in exactly the same manner. In these sessions the only variables in the instructional sequence were the inclusion or omission of an error message when the computer encountered or failed to encounter a deviating response character.

By lesson 27, routines were available which permitted the computer to omit a given block of material in a machine session if the student had handled satisfactorily a certain number of test items immediately preceding that block. Examples of such a "remedial block" and a preceding test item are given in Appendix 1 under codings such as bb, srm. Branching of this type was used throughout the course. The contents of the omittable blocks, however, changed greatly during the last weeks of the fall quarter. In session 27 and the immediately following sessions the block had often contained a short "pattern" drill on a given rule. It soon became clear that students derived little benefit from such drill, especially if the rule in question had been introduced some time before. Accordingly, during the last week of the quarter, and throughout the rest of the year, the contents of such blocks regularly consisted either of a supplementary explanation of a new rule or of an instruction to review a rule or rules presented during an earlier session. The results of the first quarter final examination (Appendix 7, Table 2) indicate that this approach was highly effective.

By the second quarter, routines had been written to allow the automatic generation of a remedial block after each of a series of drill items covered by the same rule. This development, which greatly reduced the amount of input needed in such cases, resulted in a significant increase in the number of remedial blocks included in the machine sessions.

Although no further modifications were introduced in the branch-generating routines during the academic year, there is now available a set of programs which generates a large set of remedial blocks designed to allow the detailed analysis of any error made by a student in a given sentence. Such blocks, which are generated for each Russian word of the sentence, include a test of the student's knowledge of the basic form or forms of the vocabulary item in question; a test of his awareness of the grammatical category required by the given syntactic and semantic context, and a test of his ability to generate the form corresponding to that category from the basic form. The student's performance on these tests determines whether he will be advised to review a vocabulary item or to study a syntactic or inflectional rule.

This approach to branching automatically generates machine sessions with an immeasurably more extensive set of remedial blocks than could be conveniently written by the lesson programmer himself. While there will still be cases in which it will be necessary to generate such blocks by hand, they will constitute only a small part (probably less than five per cent) of the overall total.

2.5.4. Individualization of Drill Sessions

Although no individualized drill sessions were used during 1967-68, the automatic generation of remedial blocks discussed in section 2.5.3. can easily serve as the basis for the generation of personalized drill or review sessions tailored to the needs of individual students. Thus, whenever a student fails to handle satisfactorily a vocabulary item or rule within a remedial block, the item or rule can be

noted on a separate disk file under that student's number. The file can then be scanned either by a human being or by a drill-generating program for the purpose of providing further drill and review work to each student on those items which have given him difficulty in the past and which he has been instructed to review.

2.5.5. Disk-generated Audio Stimuli

While, as was noted in 2.5.1., all audio material played during the computer-based sessions came from tapes, the groundwork was laid for the use of disk-generated audio stimuli. The use of such stimuli would make it possible to include audio material in remedial blocks--a procedure not feasible under our present system.

2.5.6. Restart Points

During the first quarter, a student who, because of technical difficulties, failed to complete a computer-based session before signing off had two alternatives: repeat the entire session or request the attendant to schedule him for the next session--a request granted only if the student had completed almost the entire session.

Beginning in the second quarter, restart points were inserted in the session text, so that the student could skip material he had already completed and could start the session close to the point he had reached on the preceding day.

2.6. Supplementary Activities

In addition to the computer-based sessions, the students in the computer-based group regularly carried on a number of additional activities designed to reinforce the material taught in the classroom. These included (a) preparation of written homework assignments (primarily the translation of English sentences into Russian, occasionally the completion of missing endings in a Russian text); and (b) work with additional audiotapes in the Stanford Language Laboratory (students listened to and repeated sentences, took Russian dictation, and wrote answers to spoken Russian questions about a paragraph read on the immediately preceding portion of the tape). No new vocabulary or grammar not previously introduced in a computer-based session was included in either the homework or the laboratory tapes. All material written by the students was placed in the slots described in 2.2., collected by a research associate, corrected, and returned to the students.

Two or three times per quarter each student was required to record on tape a short Russian passage containing only material already taught during machine sessions. Immediately after the recording was made it was evaluated for the student by a native Russian with a background in the teaching of the language. Students were informed of any pronunciation defects and advised how to correct them.

Since the computer-based sessions included a coverage of the pronunciation features regularly taught in first-year Russian, no new material on pronunciation was taught to the student during the evaluation of his recording. Rather, his attention was drawn to any points which had already been covered, but which he had failed to master.

Students who wished to discuss their work had access to staff members at the Institute and in the Slavic Division. However, such contacts, which were relatively rare, were always initiated by the student and had nothing to do with the curriculum.

2.7. Supplementary Material

2.7.1. Materials Distributed to Students

The following supplementary materials were written and distributed to the students:

1. A programmed introduction to Russian handwriting, coordinated with the first seven computer-based sessions.
2. A set of summary sheets for individual machine sessions. These sheets included both the grammar and the vocabulary presented in the session. They were generated originally for all sessions except review sessions from session 39 on. The sheets for sessions 1 through 38 are in the revised course.
3. Six pre-examination summaries containing the vocabulary and rules covered up to the midterm or final examination for each of the three quarters. These summaries covered not only material presented during the current quarter, but also material taught in the preceding quarter or quarters.
4. Homework assignments (cf. 2.6. above) coordinated with individual machine sessions. Such assignments were available regularly for all sessions, except a few review sessions beginning with session 8. (The handwriting introduction contained written homework for the first seven sessions.)
5. Response sheets for language-laboratory drills. These were sheets of paper containing the name of the drill and space for the responses.

2.7.2. Materials Not Distributed to Students

These included:

1. Forty audiotapes used for language-laboratory drills.
2. Six videotapes prepared under Professor Suppes's direction.

2.8. The Collection of Data

The data on student performance were recorded in two different forms. The first, discussed in section 2.8.2., was a detailed record of response data for each student in each lesson. The second was a daily summary of student progress.

2.8.1. The Daily Summary

This summary contained the following information for each student: the student's name and number, the number of the session taken on the day in question (if no session was taken, this was also indicated), the percentage of correct responses, the running time in minutes, and the next session scheduled for the student. Examples of daily summaries are found in Appendix 8.

The summaries were used in a number of ways. First, the classroom proctor used the summaries to ascertain which audiotape or tapes would be needed during the coming day's instruction. (As the examples in Appendix 8 show, not all students took the same lesson on the same day.) Second, the sheets also indicated which students, because of illness or other difficulties, fell more than two or three sessions behind the official schedule. Such students were contacted and arrangements were made for the necessary number of make-up sessions.

Third, the summaries were used to evaluate the effectiveness of a given session and, consequently, of new techniques which played a major role in that session. Thus, if a relatively large number of students took more than 50 minutes to finish a particular session, it was clear that the session contained material either too difficult or too voluminous to be handled within the allotted time. This knowledge was useful not only in the revision of the session itself, but also in predicting the average run time necessary for subsequent sessions of similar type and magnitude. Such sessions could then be modified to a more suitable average run time.

The same considerations applied to the percentage of correct responses. Whenever a relatively large number of students had relatively low scores (the minimal score required before the student was allowed to proceed to the next session was 70 per cent correct), it was apparent that the session was too difficult for the students to handle successfully. If, as was sometimes the case, the session was distinguished by the extensive use of a technique not previously employed or not previously used to any significant degree, it was tentatively assumed that the difficulty was attributable to that factor. This hypothesis was tested in one or two following sessions in which the technique in question played as essential a role as in the session where the low scores first appeared. If the scores in those sessions showed similar distributional characteristics, the use of the technique in question was eliminated or reduced in future sessions and in the revision of the session already written. Otherwise, it was assumed that this technique was not in itself unsatisfactory, and the session which did show a large number of low scores was reexamined in the hope of isolating other factors to which the students' difficulties could be attributed.

2.8.2. The Collection and Reduction of Detailed Data

The first quarter of the 1967-68 elementary Russian course was run under the control of programs originally developed for computer-based instruction in mathematics. While the second and the third quarters were run under an independent Russian "driver," the data-collection routines were still those developed for the mathematics driver. Increases in the flexibility and sophistication of the course radically altered the amount and type of data collected, so that it was necessary to modify the data-reduction programs developed for the first quarter's data before processing data collected during the second and third quarters. The original data for the Russian course was recorded, character by character, together with the responses to the other courses run by the drill driver.

The amount of data actually collected was enormous. Even after the characters were combined into the response or responses of each student to each item, approximately 600,000 student-items of great diversity remained. In their raw state, the data were entirely inaccessible, and it became necessary to reduce them to a usable size and format.

The reduced data, which was recorded both in a fixed-record length format (the History File) and in an editable form (the Data Report), contained the following statistics for each item. (The Russian lessons were composed of problems numbered in sequence. A problem could have several parts. The word "item" referred to a part of a problem.)

Problem number and part;

Average latency per character for correct responses;

Average latency per character for wrong responses;

Number and percentage of correct, wrong, and timed-out responses;

Number and percentage of wrong responses correct on second try;

Number and percentage of wrong responses correct on third try.

The latencies were computed only for first-trial responses. After the first quarter, students with scores below 70 per cent had to repeat lessons. Data from the repeated lessons were not included. Appendix 9 consists of three sample summaries from the Data Report, one from each quarter.

The basic record of the Russian course is in this reduced form. The original data are no longer available, because the dozens of tapes containing them were needed for other projects. Tapes and listings of the reduced data have been kept in the project files.

In spite of some difficulties of collection and reduction, the data from the first-year Russian course were of immense value, because they indicated (a) the relative effectiveness of various teaching techniques; and (b) the format in which data should be collected in future research on computer-based language instruction.

Coding the data by item. It was the task of the analyst to find groups of items or relations between such groups that were "meaningful," that is, items useful in predicting the observed performance of the students. The first step in this process was to describe the items expected to be related to student performance.

All items in the lessons selected for analysis were coded by the 15 most important numerical variables. These variables concerned the kind of task demanded of the student and how the item was presented to him (in English, by teletype, etc.); the length of the required response; the form-class of the stimulus and inflectional categories where applicable; an indication of whether or not the item was a repetition of the previous task; and an indication of whether or not the required response was a repetition of the previous response.

The coded data were recorded on magnetic tape and are kept in the project files, together with detailed notes on the assumptions and methods used in the coding. It is in this form that the data were used to obtain the lesson summaries and the analysis of sequential effects described below. With modification, the data would be suitable for much further analysis.

Lesson and quarter summaries. The coded data were first used to obtain a summary view of the entire course. The summaries, by lesson and quarter, are presented in Appendices 4, 5, 6. Many general questions about the course can be answered from them directly. They are also helpful in choosing particular blocks of items for more detailed analysis.

A summary is given for the following lessons.

First quarter:	7-20, 12-16, 18-25, 27, 29, 30, 32, 33, 34, 35, 37, 39-46;
Second quarter:	53, 55-67, 69-77, 79-83, 85, 86-91;
Third quarter:	93, 100, 102, 104, 106, 108, 110, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132.

For the first and second quarters, these were the lessons for which there were usable data for 15 or more students. (Lesson 25 with only 14 students was also included because it was a review lesson.) The data for the third quarter were reduced too late to be coded and analyzed in time for this report. A representative sample of every other lesson of the 34 lessons having data for 15 or more students was chosen.

Definitions and examples of item types. The summaries give student performance statistics for the following major types of problems. The item classification was based on the task demanded of the student. In some cases, several different commands in the script were used to introduce problems of the same type.

1. Type answers to spoken Russian. The student was asked to read a passage in Russian on the teletype. He then heard questions about the passage in Russian which he answered in a specified number of words. Example (abridged from problems 28-31, Lesson 76):

ЧИТАЙТЕ! ... МОЯ ДОЧЬ ПРИЕХАЛА	(teletype)
ПОЕЗДОМ ИЗ ЛЕНИНГРАДА.	(teletype)
ОТВЕЧАЙТЕ ОДНИМ СЛОВОМ!	(teletype)
КАК ОНА ПРИЕХАЛА?	(audio)
ПОЕЗДОМ	(correct response)

There were only three items where the questions were presented by teletype. These items were classed as "other" for the purposes of the summary.

2. Translate from teletype English. The student was required to type the Russian translation equivalent of the given word, phrase, or sentence. The stimulus item was never spoken. A wide variety of commands was used. Examples are:

(Lesson 70, Problem 112)

COMPLETE.
-PART- ПО-РУССКИ --

(Lesson 106, Problem 56)

COMPLETE. ИНФИНИТИВ СОВЕРШЕННОГО ВИДА
-TO LEAD IN- --

(Lesson 93, Problem 58) ПЕЧАТАЙТЕ ПО-РУССКИ!
WITH FORTY YOUNG LAWYERS

(Lesson 93, Problem 33) НАПЕЧАТАЙТЕ ФРАЗУ ПО-РУССКИ.
I'LL LIE DOWN ON THE BED.

Other commands were "ПЕЧАТАЙТЕ" and, usually at the end of the lesson, "We will now have a vocabulary review" followed by a string of English words with no further explanation.

3. Transcribe from spoken Russian. The student heard a Russian word, phrase, or sentence and was required to type it. The usual command was "Type what you hear."

4. Transform from teletype/spoken Russian. In general, the student heard or saw a Russian word, phrase, or sentence and was required to type a related Russian word, phrase, or sentence according to instructions given to him. There were three subtypes: (a) antonyms, "Type the word with opposite meaning"; (b) form-class transformations, "Type the noun corresponding to the verb"; and (c) all others, which were generally inflectional transformations (e.g., "Give the genitive plural of the following."). The last subclass was similar to certain examples of the last item type, "Inflect teletype Russian." The essential difference was that for an item classed as "Transform" the response had to be written out in full, whereas "Inflect" items, unless a translation was also required, needed only the addition of an inflectional ending. Example:

(Lesson 76, Problem 107)

НАПЕЧАТАЙТЕ ФОРМУ ЖЕНСКОГО РОДА ПРОШЕДШЕГО ВРЕМЕНИ. (teletype)

ПЬЁТ (teletype)

ПИЛА (response)

5. Inflect teletype Russian. This class also contained a number of subtypes. In the most frequent subtype, the student was asked to complete a Russian word with its inflectional ending. The information needed to choose the ending could be given explicitly, as in

(Lesson 68, Problem 13)

COMPLETE МУЗЕЙ, РОД. ПАД. ЕД. Ч. МУЗЕ

Or the student might be required to select the ending from the context, as in

(Lesson 68, Problem 82)

COMPLETE ОТВЕТИТЬ Я ОТВЕ

6. Translate and inflect. Another problem type, subsumed in the summaries under inflection, combined translation and inflection. A Russian context was given, together with an English word or phrase embedded in it. The student was required to translate the English into properly inflected Russian. Examples are:

(Lesson 68, Problem 33)

COMPLETE

ОН ТЕПЕРЬ -WRITES-

and (Lesson 85, Problem 22)

FILL IN

ОН ВСЕГДА -GOES- ПЕШКОМ

These last two examples illustrate one of the problems of classification.

Another fairly infrequent problem type included under inflection was the completion of spelling or morphophonemic rule.

Other item types. Rarely occurring item types were grouped together in a miscellaneous class. Examples of problems called "other" were multiple-choice questions, character-recognition problems, problems related to pronunciation, problems in arithmetic, word recognition from definition.

Preparation of the preliminary analysis. The number, percentage and latency of correct responses were selected for further analysis. To these basic statistics were added the lesson number, total number of student responses and a set of 15 variables expressing the nature of the individual items. These variables were coded in the following way. Working from the lesson scripts, and using a mnemonic alphanumeric code of up to six characters plus two digits, the codes for each item were entered on copies of the Data Report listings. When the statistics of the Data Report appeared to be incorrect, the item in question was rejected, and marked by assigning it the lesson number 1 (no actual data from the first lesson were recorded). The Data Reports were then edited--the unused statistics deleted, new ones added, and the item codes entered. Listings of the edited data were proofread by (usually) the original coder, corrections were made, and the files were then DECtaped. This version of the data is called Revised Data and a listing of it remains in the project files. A total of 85 lessons were prepared in this manner. In general, only lessons with data available for at least 15 students were prepared.

2.9. The Curriculum

A summary of the grammatical material covered in the computer-based course is given in Appendix 10.

In order to achieve a reasonably satisfactory basis for a comparative evaluation of the performances of the computer-based and the regular sections, the grammar and vocabulary presented to the former group were chosen in such a manner as to provide as large an overlap as possible with the material taught to the latter. The text used by the regular sections was the Introductory Russian Grammar by Galina Stilman and William E. Harkins.[1] All the grammar material was taught, but, since the instructors of the regular sections felt that the vocabulary in the text was far

[1] Stilman, G., & Harkins, W. E. Introductory Russian Grammar. New York: Blaisdell, 1964.

too extensive for a first-year course, they compiled a list of those vocabulary items from the book which they felt should be mastered by their own students. The students of the regular sections were informed that only words included in this list need be memorized, and it was this list, and not the total Stilman-Harkins vocabulary, which was used to determine the items included in the computer-based course.

While the vocabulary overlap was not complete, both the project staff and the instructors of the regular sections felt that a single examination for both groups was justified, because the items learned by both groups constituted a large portion, 85 to 90 per cent, of the total number of words for which the students were held responsible.

The overlap in grammatical material was even greater. Both groups covered all the inflectional material regularly taught during the first year. The sole inflectional category included in Stilman-Harkins, but not taught to the computer-based group, was the present passive participle, a category represented in their material only by two vocabulary items -ljubimyj- and -tak nazyvaemyj-. On the other hand, two topics--the second genitive and the second locative--were included in the computer-based sessions, although they were mentioned only in footnotes in Stilman-Harkins.

The material covered in any of the six half-terms of the computer-based course was sequenced according to the principal investigator's conception of the most satisfactory programmed presentation. The textbook served only as a general guide in compiling the total list of topics to be included in each half term. In addition, where this was considered conducive to a more satisfactory overall program, some material was introduced earlier in the computer-based course than in the regular sections, while other material was presented much later.

It is clear from the above that the material covered by the computer-based and the regular sections was not entirely identical. As a result, the findings discussed in section 3.1. must be viewed with considerable reservations. Nevertheless, it is true that the examinations given to both groups of students were felt to be a reasonably fair test of their achievements not only by the project staff, but also by the instructors of the regular sections, and that until further research is possible, our findings, though they leave much to be desired, represent the only comparative evidence of this type in existence.

Chapter 3

Findings and Analysis

3.1. Comparative Results of the Examinations

All midterm and final examinations conformed to the standard requirements of Stanford University for courses meeting five hours a week. These were (a) that the midterm examination be one academic hour (i.e., 50 minutes) in length, and the final examination be two full hours (i.e., 120 minutes); (b) that the examination not be identical to previous examinations in the same course; and (c) that the students not see the examination in advance.

Because of unavoidable differences in the sequencing of vocabulary and grammatical material, the examinations for the first two quarters and the spring midterm were divided into a "common portion," given to both groups, and a section which included material covered only by the group to which it was given. The spring final was entirely identical for both groups.

The text of the common portion of the first two final examinations and the complete text of the spring final are given in Appendix 11. While no claim is made that the common portion of the examinations constituted a completely objective criterion for the evaluation of the relative achievements of the computer-based and regular sections, efforts were made to prevent an overly great bias in favor of either group. Thus, during the first two quarters, the project staff prepared the common portion of one midterm and one final examination, while the instructors of the regular courses prepared the common portion of the other final and midterm. In each case, the group which prepared the material submitted it for modification to the other group before the final copy was typed. In the third quarter, each group contributed approximately 50 per cent of the material on both the midterm and the final examinations.

3.1.1. The Fall Quarter

Approximately 66 per cent of both the midterm and the final examinations for the autumn quarter were identical, both for the computer-based and for the regular Russian 1 sections. Table 1 of Appendix 7 shows the results for the midterm; Table 2 for the final. As is clear from Table 1, the midterm performance of the computer-based group was in no way superior to that of the regular students. The computer-based group, however, greatly excelled the regular group on the final. Thus, the average number of errors for the regular group was three times greater than that for the computer-based group. Fourteen out of 28 students in the regular group made more errors than did the poorest student in the computer-based group. Of 13 students who made fewer than 10 errors, 12 were in the computer-based group, while of 23 students making fewer than 20 errors, 19 were in the computer-based group.

3.1.2. The Winter Quarter

Approximately 66 per cent of both the midterm and the final examinations for the winter quarter were identical both for the computer-based and for the regular Russian 1 sections. Table 3 of Appendix 7 shows the results from the midterm; Table 4 shows those for the final.

While the performance of the computer-based group continued to be superior to that of the regular group, the most striking difference was in the number of students who completed the second quarter. Although (cf., Appendix 3) only 26 of the original 30 computer-based students remained, a much larger portion of students remained in the computer-based group than in the regular group. Since students who fail to complete at least one year of college Russian know too little to use the language effectively, it would appear that computer-based instruction would avoid much of the wasted time and effort which mark present-day university language courses.

3.1.3. The Spring Quarter

Approximately 80 per cent of the midterm examination was identical for both the computer-based and the regular groups. The final examination was completely identical for both groups. Table 5 of Appendix 7 shows the results for the midterm; Table 6 shows the results for the final examination.

While the computer-based group did only slightly better on the midterm (cf., 3.1.4.), their performance on the final which covered the entire year's material was significantly superior to that of the regular students.

The results for this final examination are particularly interesting in that they include performance data for the sole student who abandoned the computer-based course for the regular section. At the end of the second quarter, this student expressed dissatisfaction with the computer-based course and obtained the permission of an instructor in one of the regular sections to transfer to that group. As seen in the results of the spring final examination, the student was unable to perform successfully in a regular classroom setting.

The significance of his failure is unclear. On the one hand it might be seen as an indication that computer-based instruction, repugnant as it was to the student, was a major factor in his success in dealing with the work of the first two quarters. On the other hand, it might be viewed as a sign that the students in the regular sections developed a set of learning techniques for dealing with the materials of their course which the computer-based students did not acquire. Since either of these possibilities would, if correct, be of great significance in the evaluation of the effectiveness of computer-based instruction, one may hope that the future research will focus on questions of this type.

As is shown by columns 2 and 4 of Table 6, the two students who joined the computer-based course at the beginning of the winter quarter were counterbalanced by three students who joined the regular sections at the beginning of the third quarter (for their history, see Appendix 3). It follows that of the 30 students who began the computer-based course, 22, or 73-1/2 per cent successfully completed the entire three quarters of the course. Of the 38 students who entered the regular sections, only 12, or less than 33-1/3 per cent, completed three quarters. Even if the eight students who left the regular course before the end of the first quarter are disregarded, thus obtaining an initial enrollment of 30 for both groups, only 40 per cent of the regular group completed the course.

The consistently superior performance of the computer-based group is even more impressive in light of these statistics. A large number of the students who left the regular course did so because they were unable to perform satisfactorily. Since, as Appendix 3 shows, 7 of the 8 students who left the computer-based course did so for other reasons, it is not improbable that the 12 students who completed three quarters on a regular basis represented a much more gifted group than the group of 22 who completed three quarters of computer-based work. The failure of this small, select group of "survivors" to surpass the larger computer-based group, which had not been subjected to any significant "weeding-out" process based on the quality of past performance, was particularly encouraging.

3.1.4. Midterm Examination Results versus Final Examination Results

It is particularly interesting to compare the results of the midterm examinations with those of the finals in each of the three quarters. The average number of errors was practically identical for both groups on the midterm examinations. On each of the three finals, however, the computer-based group did significantly better than the regular group.

We feel that these facts are not the result of mere chance, but represent a striking illustration of one of the basic advantages of computer-based instruction as compared with regular classroom instruction--the fact that the former constitutes a much more efficient apparatus for the review of a large amount of previously learned material than does the latter. Thus, while the 50-minute midterm examinations centered primarily around vocabulary and grammar material introduced in the immediately preceding month or five weeks, the final examination included not only the material covered throughout the entire quarter, but also, in the case of the winter and spring terms, a great deal of material introduced earlier. In the classroom, it is extremely difficult, if not impossible, to ascertain in detail which of a large number of words or rules has been forgotten by which student or students. A computer-based review of the same body of vocabulary and grammar provides each individual student with detailed indications as to exactly which items he has forgotten and needs to review. If he follows these indications conscientiously, and if the time gap between the review and the examination is not too large, his chances of success are extremely good.

3.2. The Division of Labor Between Computer-based Sessions and Supplementary Activities

During the fall quarter, as a result of the information provided by the daily summaries discussed in 2.8., the scores of the midterm and final examinations, and feedback from student comments, a number of hypotheses concerning the most efficient utilization of computer-based instruction in the teaching of foreign languages gradually evolved. These hypotheses, which were to some extent confirmed by the success of instruction during the winter and spring quarters, attempted to define the optimal division of labor between computer-based and non-computer-based activities under the conditions governing work on the 1967-68 course. While a more

sophisticated set of instructional devices (display consoles, light pens, etc.) might result in a different approach, the principles outlined below would be applicable to any computer-based language course employing the devices discussed in 2.3. above.

3.2.1. Division of Labor Between the Computer and the Language Laboratory

As the course progressed, it became apparent that certain activities which in the first lessons had been included in the computer-based sessions would be more effectively handled if relegated primarily to the language laboratory. This was particularly true of dictated sentences and responses to questions about material presented orally. These items proved much harder to type than to write down. Since all material to be checked by the computer had to be typed, the second half of the first quarter saw a gradual reduction in the length and number of such items in the computer-based lessons. However, other audio-lingual activities such as reading sentences after the speaker, responding to questions about typed material, or simply saying Russian sentences and then checking them against the tape, were retained as part of the computer-based lessons. As things now stand, the student acquires the correct pronunciation of vocabulary items and a basic acquaintance with spoken Russian in his computer-based sessions. He extends this knowledge and undergoes extensive testing on his ability to comprehend spoken Russian in the language laboratory. His pronunciation is tested by the evaluation tapes described earlier.

3.2.2. Division of Labor Between the Computer and Written Homework

It became clear during the first few weeks of the course that the computer was much more effective in handling smaller, more closely knit constructions than in dealing with long sentences or paragraphs. It was, therefore, decided to use the computer-based sessions primarily for the introduction and drilling of "building blocks" (i.e., sentence constituents) and to leave extensive work with long Russian sentences to the homework assignments. The results of the final examinations seemed to bear out the validity of the assumption underlying this approach, i.e., that a student who has mastered the production of sentence constituents thoroughly will have little difficulty in producing sentences composed of those constituents. While complete sentences are, of course, included in the computer-based sessions, they are generally given only after the student has performed intensive drill work on any new sentence components they may involve. Even under these conditions, sentences to be typed during the computer-based sessions were generally short and centered around one or two key constructions which were among the topics of the given lesson.

On the other hand, the number of sentences included in the written homework was significantly increased and special efforts were made to make sure that these sentences called for constructions covered not only by current lessons, but also by previous work. As things stand now, the computer's job is primarily teaching vocabulary items and grammatical

constructions. The integration of new vocabulary items and grammatical patterns into previously assimilated material is accomplished more effectively by written homework.

3.2.3. Division of Labor Between the Computer and Lesson Summaries

Perhaps the most striking change which took place during the course of the first quarter's work was the role played by summaries for outside study. During the first 27 lessons, no outside summaries were given, and students wishing to review material had to do so on the basis of the printout of their computer-based sessions. It soon became apparent that such an approach tended to decrease the effectiveness of the computer-based course, since the student had to create his own material for outside study. Between the first of December and the final examination for the fall quarter, lesson summaries were provided for each new lesson, and a final summary was provided covering the material of the entire quarter. Furthermore, during the final week's review, instead of providing the students with the correct answers to the review problems they missed, the computer simply told them to review a given rule or rules. The results of the fall final examination indicated that this approach was highly successful, and it was continued throughout the year.

Thus, the computer's role in reviewing material is that of a tutor who assesses a student's performance and, when necessary, directs him to the proper portion of his summary sheets. At following sessions the student is again tested on any items missed and informed whether more study is needed.

3.3. Findings of the Preliminary Data Analysis

The methods for collection and reduction of data, and the preparation of a preliminary analysis are discussed in section 2.8.

3.3.1. Lesson Summary Statistics

The number of items, average percentage correct, and mean and standard deviation of the correct latency appear for each category in the summary. The average percentage correct was the sum of the percentage correct for each item divided by the number of items. The average correct latency was the sum of the latency per character for the correct responses for each item divided by the number of items. The standard deviation was computed from the formula

$$\sqrt{(\Sigma L^2 - (\Sigma L / N)^2 / N-1)},$$

where L was the item latency and N X was the number of items.

3.3.2. Observations from Lesson Summaries

Over the year, the percentage correct was very close to 80 per cent. A quick inspection showed that the variation from lesson to lesson was adequately controlled. Only five lessons (13, 19, 37 (examination),

91, 93) fell outside the range of 70 to 90 per cent, and the great majority was between 75 and 85 per cent.

In general, the comprehension task ("Type Answers") was the most difficult; the average correct was 72 per cent. Inflection was the easiest at 84 per cent. This last figure is deceptive, however, as can be seen from the analysis in section 3.3.3.

No obvious trends appeared, except in the case of transcription, for which the quarter totals were the ascending sequence 75, 91, and 94 per cent. It is probable that this reflected a gradual improvement in student performance, as inspection of the lesson summaries shows. For approximately the first 10 lessons, the average correct was 70 per cent, climbing to near 80 per cent for the rest of the quarter. Greater familiarity with the Russian alphabet and teletype keyboard may account for this increase. There was a second jump to the level of the second quarter, within which there was a rather small upward trend. This was due to the introduction early in the second quarter of computer program routines that permitted the student to inspect and correct his response before submitting it to the computer for correction.

The comparison of visual and aural stimuli was possible only for the transform items. The visually presented items were easier, as would be expected.

3.3.3. Analysis of Sequential Effects

The effect of the preceding item upon the difficulty of a given item was found to be significant in the Institute's computer-based instruction of arithmetic and other subjects. Preliminary inspection of the data indicated that this effect was also present in the Russian course. Accordingly, we chose to complete the data analysis for the reporting period with a preliminary investigation of sequential effects.

Two variables, "type" and "content," were considered. Every item was either a repetition of the type of previous item ("same type") or not ("different type"), and the response to an item was either the same as that to the preceding item ("same content") or not ("different content"). Thus, every item belonged to one of four classes thus defined.

The intuitive notion behind these variables was simple enough. It was presumed that a student's performance was adversely affected by a shift to a new task ("different type"). Further, it was presumed that there was a tendency to repeat the previous response.

3.3.4. Criteria for Defining Different Item Types

The following partition of items was used to define different items. It represents only our first hypothesis of a meaningful partition, and it is likely that modifications would be desirable for more detailed analysis.

Type answers to teletype Russian;

Type answers to spoken Russian;

Translate English word;

Translate English phrase or sentence;

Transcribe character;

Transcribe word;

Transcribe phrase or sentence;

Transform spoken word--antonym;

Transform spoken word--form class;

Transform spoken word--inflection;

Transform spoken phrase or sentence--inflection;

Transform teletype word--antonym;

Transform teletype word--form class;

Transform teletype word--inflection;

Transform teletype phrase or sentence--inflection;

Inflect from context;

Inflect from explicit instructions;

Translate and inflect;

All other types.

The classes "Translate English word" and "Translate English phrase or sentence" were counted as the same type if they both occurred in a list with common instructions. At times, an explanation intervened between items of the same type. The second item was then coded as "different type."

3.3.5. Criteria for Defining Different Content

An item was coded "same content" if its response was the same as that of the previous item. (A morphonemic variant was not the same.) Where problems had several parts, a response could be the same as the response to the corresponding part of the preceding problem, but not the same as that to the preceding item (preceding part of the same problem). Such items were coded as "same content."

For "Transform inflection" items, the same inflection was required for different stems. In general, if no stem modification was required, such items were coded as "same content."

One deviation from these criteria was made. For nominal inflections, if the responses of two consecutive items were the same, but different cases were required, the second item was coded as "different content." This was an arbitrary decision, whose validity could presumably be decided from the data themselves. It reflected our impression that the "copying effect" of a previous response would be largely neutralized by the request for a different case. In practice, the problems were so arranged that a change in case almost always implied a change in form.

3.3.6. Item Categories

The item categories were changed slightly from those used for the lesson summaries. "Type answers," "Translate," and "Transcribe" remained the same. Because items of the same content occurred almost exclusively with the items requiring inflection, the previous "Transform inflection" classes were subdivided to reflect this. Instead of splitting the "Transform" items according to whether the stimulus was spoken or typed, the antonym and form-class transforms were opposed to the inflectional ones. The "Inflect" items also requiring translation of an English element were split off from the rest. "Inflect Rule," as well as the miscellany of "Other Types," was not treated.

The statistics were computed over seven blocks of lessons: 1-19 (11 lessons); 20-33 (11 lessons); 34-46 (11 lessons); 47-65 (12 lessons); 66-79 (12 lessons); 80-92 (11 lessons); and 93-135 (17 lessons).

The summaries of the analysis are presented in Appendix 12. The statistics were computed as in the lesson summaries, except that the sample variance was used instead of its square root, and the sample variance was also computed for the average correct percentage.

3.3.7. Observations about Sequential Effects

For the "Transform inflection" and "Inflect" items, the effect of repeating an item with the same response ("Same Content") was striking. The "Inflect" items with the same content consistently had an average correct of about 95 per cent, with the "Translate" and "Inflect" and the "Transform-Inflection" items slightly lower. This means that on the average, only one student made a mistake on these items. This suggests that perhaps such repetition was unnecessary and inefficient. In fact, this conclusion was anticipated by the author of the course and, as the data show, the proportion of such repetition was greatly reduced during the course of the year.

Contrary to our expectations, there seems to be no indication that the appearance of a new type of problem exercised a predictable effect on student performance. It is, of course, conceivable that a significant effect was masked by uncontrolled variation.

This may seem surprising in view of the obvious differences between the "same" and "different" columns for "Translate" and "Transcribe" items. It is just these items, however, which show the greatest variation in response length. Furthermore, the translation and transcription of phrases and sentences tended to occur as single items while words occurred in blocks. Thus, the harder, longer items tended to dominate the "different type" category. This explanation seems the more plausible since no marked difference between the items of "same" and "different" types turned up consistently for the other item classes where the variation in length of response was small.

Apart from the sequential effects, the analyses revealed that the Translate-and-Inflect items were markedly more difficult than the Inflect items. It was naturally expected that items with an added task were more difficult than without. The shorter correct latencies are probably in part explainable by the greater number of characters in the responses to the Translate-and-Inflect items, so that the effect of the latency to the first character was distributed over more units in the average. It should be noted that the extra task of "translation" was not homogeneous. The added difficulty could have been a stem modification, use of words in given contexts (i.e., verbs of motion), as well as simple word-for-word translation from English to Russian.

3.3.8. Areas for Further Research

No further analysis could be completed during the reporting period. As they stand, the data present rich opportunities for further research. The study of the difficulty of comprehension items, the nature of the learning of inflectional patterns and vocabulary learning should be particularly fruitful.

The learning of an inflectional system is of great interest to the linguist and psychologist. The linguist finds this a likely area to test theories of language structure, and the psychologist to test theories of concept learning. It is felt that the present data are particularly valuable for this area. First, Russian is a highly inflected language whose structure has been extensively studied. The native language of the students, English, is probably as desirable as any, since its inflectional system is rudimentary. The major problem in studying the acquisition of an inflectional system is that it cannot be studied easily in bits and pieces, since the interactions within the entire system constitute one of the principal interests. Here, however, we have the good fortune to possess data on the learning of the entire nominal inflectional system of Russian by a homogeneous group of students.

Past speculations about the learning of inflections have been limited to the listing of pertinent factors, one or more of which can usually be invoked to explain learning difficulties. What is needed, and what may well be obtained from the present data, is an indication of the relative importance of such factors in given circumstances and the interaction among the factors and circumstances.

Chapter 4

Conclusions

4.1. Goals Achieved and Suggestions for Further Research

The main objective in developing and implementing a computer-based course in first-year college Russian was to ascertain the extent to which such a course provided a desirable alternative to regular classroom instruction. The findings discussed in section 3.1. indicate that, at least insofar as the translation of English sentences into Russian is concerned, computer-based instruction is probably more effective than a regular classroom-taught course. Although it would be desirable to investigate this question on a wider scale than was possible in the present case, there is every reason to believe that the introduction of computer-based instruction in elementary language courses in which the acquisition of writing plays an important role would greatly improve the effectiveness of those courses.

The set of principles discussed in section 3.2. constitutes a first step in the direction of a general theory concerning the optimal utilization of computer-based sessions in second-language learning. The development of the "building-blocks" concept as the fundamental notion underlying the division of labor between such machine sessions and supplementary, non-computer-based activities has, we feel, provided other scholars concerned with the creation of computer-based language courses with a fruitful way of approaching this problem. While this area too needs further investigation, there is every reason to anticipate that the general strategy evolved during the work on this project will prove a successful one.

The results of the analysis of the detailed data were necessarily preliminary in character. However, useful summaries of main aspects of the course were made and will be helpful to anyone doing further work in this area.

4.2. Disposal of Course Materials and Detailed Data

The printout of the full text of the computer-based sessions (10 volumes including more than 300 pages each), the handwriting booklet, the homework assignments and study sheets, the pre-examination summaries, the printout of the reduced data described in 2.8. (some 350 pages), and a complete set of all audio and video tapes made in connection with this project are on file at the Institute for Mathematical Studies in the Social Sciences, where they will be made available to scholars interested in a firsthand acquaintance with these materials.

In consideration of this fact, these materials will not accompany the final report.

Appendix 1

The Coding of Input for Computer-based Sessions

Lessons are coded in a shorthand coding hereafter referred to as "input code." This is the basic format used to specify lessons. A standard transliteration will be employed.

Russian preprocessor I (RP-I) is used to convert this text to a format that can be listed with the Russian lister on teletypes with Russian characters. These listings are used as a script for recording the audio.

Russian preprocessor II (RP-II) converts this "listable code" into "run-time code" for the main program.

Examples of raw and processed input follow.

```
INPUT OP-CODES

INPUT     <IF PRECEDED BY -REM- WILL BE TREATED AS A TEST

BB        KNIG(A)+    <PLUS MEANS NEW ITEM ON NEXT LINE
          DAM(A)      <LAST ITEM DOES NOT HAVE A PLUS
                      <NO LIMIT TO NUMBER OF ITEMS
OUTPUT
TRY       1
GAA       1
TE        COMPLETE.
LR        KNIG(A)
LR        DAM(A)
RET       2
-------------------------
INPUT     <REMEDIAL --- -BB- USED AS A TEST

REM       RULE XX+
BB        KNIG(A)+
          DAM(A)

OUTPUT

TRY       1
GAA       1
TE        COMPLETE.
TST       1
LR        KNIG(A)
BLK       .
RET       1
TE        REVIEW RULE XX
FIN       .
TST       1
LR        DAM(A)
BLK       .
RET       1
TE        REVIEW RULE XX
FIN       .
RET       2
---------------------
BZ        SAME AS -BB- EXCEPT COMPLETE OMITTED-,TAKES -REM-
```

INPUT OP-CODES (CONT.)

```
INPUT     <DOES NOT TAKE -REM-

D         BRAT+        <ONLY ONE ITEM ALLOWED
          BROTHER      <PLUS MEANS OPTIONAL ENG. TRANSLATION

OUTPUT

TRY       1
GAA       1
TE        READ ALOUD
RET       1
TR        BRAT
RET       1     <OMITTED IF ENG. TRANS. DOES NOT FOLLOWED
TE        BROTHER     <OPTIONAL
RET       2
-----------------------------
DM        <SAME AS -D- EXCEPT USES DIFFERENT INSTRUCTIONS
TE        READ AFTER ME
-------------------------
INPUT     <DOES NOT TAKE -REM-
DMS       ON+   <SAME INPUT PATTERN AS -D-
          HE
OUTPUT
TRY       1
GAA       1
TR        PROHITAJTE FRAZU ZA MNOJ.
RET       1
TR        ON
AR        ON
WAT       20    <PROGRAM CALCULATES WAIT TIME
RET       1
TE        HE    <OPTIONAL AS IN -D-
RET       2
-----------------------------
DMR       <SAME AS -DMS- EXCEPT USES DIFFERENT INSTRUCTIONS
TR        HITAJTE ZA MNOJ.
-------------------------
INPUT
EQ        BRAT+        <ONLY ONE ITEM ALLOWED-NEEDS PLUS
          BROTHER      <TRANS. ALWAYS FOLLOWS
OUTPUT
AR        BRAT/ MEANS BROTHER
RET       1
TR        BRAT    /BROTHER
RET       2
--------------------
```

```
INPUT     <DOES NOT TAKE -REM- YET
FD        PIS;M(O)+   <STEM(ENDING) --NEEDS PLUS
          NO1+        <3 CHAR. CODE FOR TABLE--NEEDS PLUS
          PS, IS, GS, AS,     <1-10 TWO CHAR. SYMBOLS
                              <ALWAYS FOLLOWED BY A COMMA

OUTPUT
TRY       1
GAA       1
TE        COMPLETE THE FOLLOWING FORMS OF( PIS;MO
LE        P.S.    PIS;M(E)
LE        I.S.    PIS;M(OM)
LE        G.S.    PIS;M(A)
LE        A.S.    PIS;M(O)
RET       2
--------------------------
INPUT TAKES -REM-, ANY NO. OF ITEMS, IF -SR- IS LONGER THAN
          ONE LINE ANSWER MUST BE ON LAST LINE OF -SR-

F         )TA ULIC(A) OHEN; GR>SN(A>).+
          > NE UME(<) HITAT; PO-RUSS(KI).

OUTPUT

TRY       1
GAA       1
TE        FILL IN.
SR        )TA ULIC(A) OHEN; GR>SN(A>).
SR        > NE UME(<) HITAT; PO-RUSS(KI).
RET       2
-------------------------------------------------
INPUT DOES NOT TAKE -REM- SERIES, ANY NO. OF ITEMS

FSA       VY BYLI VHERA NA LEKC(II)?+
          U )T(IX) MOLOD(YX) L<DEJ MNOGO KNI(G).

OUTPUT

TRY       1
GAA       1
AE        LISTEN TO WHAT I SAY THEN FILL IN THE BLANKS.
AFR       VY BYLI VHERA NA LEKCII?
SR        VY BYLI VHERA NA LEKC(II)?
AFR       U )TIX MOLODYX L<DEJ MNOGO KNIG.
SR        U )T(IX) MOLOD(YX) L<DEJ MNOGO KNI(G).
RET       2
-------------------------------------------------
```

```
INPUT NO -REM-, ONE ITEM ONLY

L          DAMA

OUTPUT

TE         LISTEN.
RET        1
TR         DAMA
AR         DAMA ...
           DAMA
RET        2
-----------------------------------------------
INPUT
LCE        (D) A'(M) A+
           LADY

OUTPUT
TRY        1
GAA        2
TE         LISTEN.
AR         DA'MA
           DA'MA
TE         LISTEN AGAIN, THEN COMPLETE THE WORD.
AR         DA'MA
           DA'MA
TST        1
SR         (D) A'(M) A
BLK        .
RET        1
TE         COPY THE NEW WORD WITHOUT THE STRESS.
LR         (DAMA)
FIN        .
RET        1
TR         DA'MA/MEANS -LADY-
RET        2
-----------------------------------
```

```
INPUT
LGE       DA'MA+
          LADY

OUTPUT
TRY       1
GAA       1
TE        LISTEN CAREFULLY.
AR        DA'MA
          DA'MA
TE        LISTEN AGAIN AND THEN TYPE THE NEW WORD.
AR        DA'MA
          DA'MA
TST       1
NLR       (DAMA)
BLK       .
RET       1
TE        NOTE THAT[DA'MA/CONTAINS NO NEW SOUNDS OR LETTERS.
          COPY IT.
NLR       (DAMA)
FIN       .
RET       1
TR        DA'MA MEANS -LADY-
RET       2
-----------------------------------
```

```
INPUT NO -REM-, ONE ITEM ONLY

0          MAL;HIK

OUTPUT

TE         OBSERVE
RET        1
TR         MAL;HIK
RET        2
------------------------
INPUT NO -REM-, ONE ITEM ONLY

R          KARTINA

OUTPUT

TE         REPEAT.
RET        1
TR         KARTINA
AR         KARTINA...
           KARTINA...
RET
--------------------
RMS        SAME AS -DMS- EXCEPT RUSSIAN INSTRUCTIONS
TR         POVTORITE FRAZU ZA MNOJ.
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

S         HE IS SICK.+
          ON BOLEN.

TE        SAY--HE IS SICK.
WAT       30
AR        ON BOLEN.
RET       2
----------------------
SRR       SAME AS -S- EXCEPT RUSSIAN INSTRUCTIONS
TR        SKAQITE PO-RUSSKI--/WHERE IS BORIS?
--------------------------
INPUT DOES NOT TAKE -REM- ANY NO. OF ITEMS

SA        GDE VY BYLI VHERA?+
          NA LEKCII+
          A GDE BYL VAW MUQ?+
          NA SOBRANII

TE        SAY THE ANSWER.
RET       1
TR        GDE VY BYLI VHERA?
AR        NA LEKCII
RET       1
TR        A GDE BYL VAW MUQ?
AR        NA SOBRANII
RET       2
--------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

SOW       VY ID←TE NA KONCERT?+
          DA.+
          A BORIS ID←T?+
          NET.

TE        SAY A ONE WORD ANSWER.
RET       1
TR        VY ID←TE NA KONCERT?
AR        DA.
RET       1
TR        A BORIS ID←T?
AR        NET.
RET       2
-------------------------------
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

SOP       UMNYJ+
          GLUPYJ+
          KRASIVYJ+
          NEKRASIVYJ+
          BOL;WOJ+
          MALEN;KIJ
TE        SAY THE WORD WITH THE OPPOSITE MEANING.
RET       1
TR        UMNYJ
AR        GLUPYJ
RET       1
TR        KRASIVYJ
AR        NEKRASIVYJ
RET       1
TR        BOL;WOJ
AR        MALEN;KIJ
RET       2
-----------------------
```

```
INPUT
SRM       SPECIAL REMEDIAL ROUTINES
          VARIED INPUT
          <NOTE THAT -IS, ARE, THE, A, AN- ARE AUTOMATICALLY
          ELIMINATED FROM STORED INPUT AND THUS ARE NOT
          COUNTED WHEN CODING THE SENTENCE

          MOMMA IS AT?HOME.+        <-AT- IS COUNTED AS WORD 2
          MAMA DOMA          <AND STORED WITH WORD 3 AS ONE UNIT

          WE WRITE.+
          MY PI(WEM,SAT;,WUT)+
          2VA1PVPR1

          IVAN IS READ(ING,) AN INTERESTING BOOK TO BORIS.+
          IVAN HITA(ET,T;,<T) INTERESN(U<,YJ) KNIG(U,A)
          BORIS(U,)+              <NOTE ZERO CODING FOR 2ND ENDING
          2VA3S VPR1, 3AFAAFS, 4NASNAA, 5NDSNSD

          HE IS L(YING,IE)?DOWN.+
          ON LEQ(IT,AT;,AT)+
          2VN3SRULE
```

```
INPUT DOES NOT TAKE -REM-, ONLY ONE SENTENCE ALLOWED
        NOT TO EXCEED 9 RUSSIAN WORDS

SRM     MOMMA IS A LADY.+
        MAMA DAMA

OUTPUT
TRY     1
GAA     2
TST     1
TE      TYPE IN RUSSIAN.
        MOMMA IS A LADY.
NLR     (MAMA ) (DAMA)
BLK     1
TRY     1
GAA     1
RET     1
TST     1
LE      THE BASIC FORM OF -MOMMA- IS [(MAMA)
BLK     .
RET     1
TE      REVIEW THIS WORD IN YOUR VOCABULARY.
FIN     .
FIN     .
BLK     2
TST     1
LE      THE BASIC FORM OF -LADY- IS[(DAMA)
BLK     .
RET     1
TE      REVIEW THIS WORD IN YOUR VOCABULARY.
FIN     .
FIN     .
BLK     .
RET     1
TRY     2
GAA     1
TE      TRY THE SENTENCE AGAIN.
NLR     (MAMA DAMA)
FIN     .
RET     2
```

```
INPUT TAKES -REM-, ANY NO. OF ITEMS

T         WHERE ARE YOU FLYING?+
          KUDA VY LETITE?

TRY       2
GAA       1
TE        TYPE IN RUSSIAN.
RET       1
TE        WHERE ARE YOU FLYING?
NLR       (KUDA VY LETITE?)
RET       2
-------------------------------
TRR       SAME AS -T- EXCEPT RUSSIAN INSTRUCTIONS
TR        PEHATAJTE PO-RUSSKI!
-------------------------
IRZ       SAME AS -T- EXCEPT INSTRUCTIONS OMITTED
--------------------
INPUT TAKES -REM- , ANY NO. OF ITEMS.+

TSR       SHE IS HOME.+
          ONA DOMA

TRY       2
GAA       1
TR        NAPEHATAJTE FRAZU PO-RUSSKI./
TE        SHE IS HOME.
NLR       (ONA DOMA)
RET       2
-----------------------------
```

```
INPUT
TC 1        MOMMA+
            MAMA+
            YES+
            DA

OUTPUT
TRY         !
GAA         !
TE          TYPE IN RUSSIAN
TST         !
TE          MOMMA
NLR         (MAMA)
BLK         .
RET         !
TE          COMPLETE THE WORD FOR MOMMA
SR          (M)AM(A)
SR          M(AM)A
TE          NOW TYPE THE WHOLE WORD.
NLR         (MAMA)
FIN         .
TE          TYPE IN RUSSIAN
TST         !
TE          YES
NLR         (DA)
BLK         .
RET         !
TE          COMPLETE THE WORD FOR YES
SR          (D)A
TE          NOW TYPE THE WHOLE WORD.
NLR         (DA)
FIN         .
```

```
INPUT TAKES -REM-, ANY NUMBER OF ITEMS

THW       OK NO+
          WINDOW+
          DVER;+
          DOOR+
          SAMOL←T+
          AIRPLANE

TRY       2
GAA       1
TE        TYPE
AFR       OK NO
          OK NO
LR        (OK NO)
RET       1
TE        WINDOW
AFR       DVER;
          DVER;
LR        (DVER;)
RET       1
TE        DOOR
AFR       SAMOL←T
          SAMOL←T
LR        (SAMOL←T)
RET       1
TE        AIRPLANE
RET       2
--------------------
TWR       SAME AS -THW- EXCEPT RUSSIAN INSTRUCTIONS
TR        PEHATAJTE!
--------------------
INPUT DOES NOT TAKE -REM-, ONLY ONE ITEM ALLOWED

THS       MO> BABUWKA UEXALA.+
          MY GRANDMOTHER LEFT.   <ENG. TRANSLATION OPTIONAL

TRY       2
GAA       1
TE        TYPE
AR        MO> BABUWKA UEXALA.
          MO> BABUWKA UEXALA.
LR        (MO> BABUWKA UEXALA.)
RET       1
TE        MY GRANDMOTHER LEFT.
RET       2
--------------------
THR       SAME AS -THS- EXCEPT RUSSIAN INSTRUCTIONS
TR        PEHATAJTE!
------------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS ALLOWED

TOP       MAL;HIK+
          DEVOHKA+
          XOROWIJ+
          PLOXOJ

TRY       2
GAA       1
TE        TYPE THE WORD WORD WITH THE OPPOSITE MEANING.
RET       1
TR        MAL;HIK
NLR       (DEVOHKA)
RET       1
TR        XOROWIJ
NLR       (PLOXOJ)
RET       2
----------
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS ALLOWED

TTT       GDE VY QIV←TE?+
          V MOSKVE+
          KUDA VY LETITE ZAVTRA?+
          V LENINGRAD.

TRY       2
GAA       1
TE        TYPE THE ANSWER.
AR        GDE VY QIV←TE?
          GDE VY QIV←TE?
LR        (V MOSKVE)
AR        KUDA VY LETITE ZAVTRA?
          KUDA VY LETITE ZAVTRA?
LR        (V LENINGRAD.)
RET       2
----------
TTR       SAME AS -TTT- EXCEPT RUSSIAN INSTRUCTIONS
TR        OTVEHAJTE NA TELETYPE
----------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

T1 W        TU ID←W; NA SOBRANIE?+
            DA+
            A KAT>?+
            NET

TRY         2
GAA         1
TE          TYPE ONE WORD ANSWERS.
AR          TU ID←W; NA SOBRANIE?
            TU ID←W; NA SOBRANIE?
LR          (DA)
AR          A KAT>?
            A KAT>?
LR          (NET)
RET         2
------------------------
T1R         SAME AS -T- EXCEPT RUSSIAN INSTRUCTIONS
TR          OTVEHAJTE ODNIM SLOVOM.
------------------------
T2 W        KUDA MAWA EDET?+
            V WKOLU.+
            ONA EDET AVTOBUSOM?+
            NET, PEWKOM.

TRY         2
GAA         1
TE          TYPE TWO WORD ANSWERS.
AR          KUDA MAWA EDET?
            KUDA MAWA EDET?
LR          (V WKOLU.)
AR          ONA EDET AVTOBUSOM?
            ONA EDET AVTOBUSOM?
LR          (NET, PEWKOM.)
RET         2
------------------------
T2R         SAME AS -T2 W- EXCEPT RUSSIAN INSTRUCTIONS
TR          OTVEHAJTE DVUM> SLOVAMI.
--------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

T3W       KOGDA PRILETIT SAMOL←T?+
          V DVA HASA.+
          A KOGDA ULETIT?+
          V POLOVINE P>TOGO.

TRY       2
GAA       1
TE        TYPE THREE WORD ANSWERS.
AR        KOGDA PRILETIT SAMOL←T?
          KOGDA PRILETIT SAMOL←T?
LR        (V DVA HASA.)
AR        A KOGDA ULETIT?
          A KOGDA ULETIT?
LR        (V POLOVINE P>TOGO.)
RET       2
-------------------------
T3R       SAME AS -T3W- EXCEPT RUSSIAN INSTRUCTIONS
TR        OTVEHAJTE TREM> SLOVAMI.
-------------------------
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

T4W       GDE KAT>?+
          ONA POWLA K BORISU.+
          ONA SKORO PRID←T?+
          V P>T; S POLOVINOJ.

TRY       2
GAA       1
TE        TYPE FOUR WORD ANSWERS.
AR        GDE KAT>?
          GDE KAT>?
LR        (ONA POWLA K BORISU.)
AR        ONA SKORO PRID←T?
          ONA SKORO PRID←T?
LR        (V P>T; S POLOVINOJ.)
RET       2
-------------------------
T4R       SAME AS -T4W- EXCEPT USES RUSSIAN INSTRUCTIONS
TR        OTVEHAJTE HETYR;,> SLOVAMI.
-------------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NUMBER OF ITEMS

T5W     BORIS UMNYJ?+
        DA, ON OHEN; UMNYJ MAL;HIK .+
        KTO EGO L<BIT?+
        EGO VSE DETI OHEN; L<B>T.

TRY     2
GAA     1
TE      TYPE FIVE WORD ANSWERS.
AR      BORIS UMNYJ?
        BORIS UMNYJ?
LR      (DA, ON OHEN; UMNYJ MAL;HIK .)
AR      KTO EGO L<BIT?
        KTO EGO L<BIT?
LR      (EGO VSE DETI OHEN; L<B>T.)
RET     2
-----------------------
T5R     SAME AS -T5W- EXCEPT USES RUSSIAN INSTRUCTIONS
-----------------------
```

```
INPUT ALLOWS ANY NO. OF ITEMS, TEST BLOCKS ALWAYS INCLUDED
          WITHOUT USE OF -REM-

TBK       RULE N.G.M2+    <PARENTHESES NOT ALLOWED IN THIS LINE
          DOM()GEN.(A)+
          STOL()G.(A)+
          STUDENT()G.(A)

TRY       I
GAA       I
TE        COMPLETE.
TST       I
LR        DOM/GEN.[DOM(A)
BLK       .
RET       I
TE        REVIEW RULE N.G.M2
FIN       .
TST       I
LR        STOL/G.[STOL(A)
BLK       .
RET       I
TE        REVIEW RULE N.G.M2
FIN       .
TST       I
LR        STUDENT/G.[STUDENT(A)
BLK       .
RET       I
TE        REVIEW RULE N.G.M2
FIN       .
RET       2
--------------------------
TKZ       SAME AS -TBK- EXCEPT INSTRUCTION -COMPLETE- IS OMITTED
--------------------------
```

```
INPUT TAKES ANY NO. OF ITEMS , TEST BLOCKS ALWAYS INCLUDED
      WITHOUT USE OF -REM-

TBD   THE RULE.+      <PARENTHESES NOT ALLOWED IN THIS LINE.
      DAM(A) G.S.(Y)+
      D.S.(E)+
      D.S.(U)
TRY   I
GAA   I
TE    COMPLETE.
TST   I
LR    DAMA/ G.S.[DAM(Y)
BLK   .
RET   I
TE    REVIEW THE RULE.
FIN   .
TST   I
LE          D.S.[DAM(E)
BLK   .
RET   I
TE    REVIEW THE RULE.
FIN   .
TST   I
LE          D.S.[DAM(U)
BLK   .
RET   I
TE    REVIEW THE RULE.
FIN   .
RET   2
-------------------------
TDZ   SAME AS -TBD- EXCEPT INSTRUCTION -COMPLETE- IS OMITTED
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

VOC       BROTHER+
          BRAT+
          SISTER+
          SESTRA

TRY       1
GAA       1
TE        WE WILL NOW HAVE A VOCABULARY REVIEW.
RET       1
TE        BROTHER
NLR       (BRAT)
RET       1
TE        SISTER
NLR       (SESTRA)
RET       2
--------------------------
```

```
W         THE GEN. PL.+
          GLUP(A>)(YX) DA(MA)(M)+
          ]T(I)(IX) KRASIVY(E)(X) DET(I)(EJ)

WAT       30
TRY       1
GAA       1
TE        TYPE THE GEN. PL.
AFR       GLUPA> DAMA
          GLUPA> DAMA
LR        (GLUPYX DAM)
AFR       ]TI KRASIVYE DETI
          ]TI KRASIVYE DETI
LR        (]TIX KRASIVYX DETEJ)
RET       2
-------------------------
WR        SAME AS -W- EXCEPT USES RUSSIAN INSTRUCTIONS
WR        FORMU MNOQESTVENNOGO HISLA+
          DAM(A)(Y)+
          MOLOD(A)(YE) BAB(A)(Y)

TRY       1
GAA       1
TR        NAPEHATAJTE FORMU MNOQESTVENNOGO HISLA
AFR       DAMA
          DAMA
LR        (DAMY)
AFR       MOLODA BABA
          MOLODA BABA
LR        (MOLODYE BABY)
RET       2
-------------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

WW        THE SINGULAR.+
          SAMOL←(TY)(T)+
          NEPRI>TN(YE)(A>) DEVOHK(I)(A)

TRY       1
GAA       1
TE        TYPE THE SINGULAR.
RET       1
TR        SAMOL←TY
NLR       (SAMOL←T)
RET       1
TR        NEPRI>TNYE DEVOHKI
NLR       (NEPRI>TNA> DEVOHKA     )
RET       2
--------------------------
INPUT DOES NOT TAKE -REM-, ANY NO. OT ITEMS

WWR       FORMU MOQESTVENNOGO HISLA+
          ULIC(E)(AM)+
          WIROK(OJ)(IM) DOROG(E)(AM)

TRY       1
GAA       1
TR        NAPEHATAJTE FORMU MOQESTVENNOGO HISLA
RET       1
TR        ULICE
LR        (ULICAM)
RET       1
TR        WIROKOJ DOROGE
LR        (WIROKIM DOROGAM)
RET       2
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS

Y         THE PLURAL.+
          MAM(A) (Y)+
          DAM(A) (Y)

TRY       1
GAA       1
TE        SAY THE PLURAL.
RET       1
TR        DAMA
WA        10
AR        DAMY
RET       1
TR        MAMA
WAT       10
AR        DAMY
RET       2

-------------------------
YR        SAME AS Y EXCEPT USES RUSSIAN INSTRUCTIONS
TR        SKAQITE...

-------------------------
```

```
INPUT DOES NOT TAKE -REM-, ANY NO. OT ITEMS

YY          THE PLURAL+
            UZK(A>)(IE)+
            DLINN(YJ)(YE), WIROK(IJ)(IE) ZDANI(E)(>)

TRY         1
GAA         1
TE          SAY THE PLURAL
AR          UZKA>
            UZKA>
AR          UZKIE
AR          DLINNYJ, WIROKIJ ZDANIE
            DLINNYJ, WIROKIJ ZDANIE
AR          DLINNYE, WIROKIE ZDANI>
RET         2
-------------------------
INPUT DOES NOT TAKE -REM-, ANY NO. OF ITEMS
            SAME AS -YY- EXCEPT USES RUSSIAN INSTRUCTIONS

YYR         FORMU MNOQESTVENNOGO HISLA+
            STU(L)(L;>)+
            OKOLO UDOBN(OGO)(YX) KRES(LA)(EL)

TRY         1
GAA         1
TR          SKAQITE FORMU MNOQESTVENNOGO HISLA
AR          STUL
            STUL
AR          STUL;>
AR          OKOLO UDOBNOGO KRESLA
            OKOLO UDOBNOGO KRESLA
AR          OKOLO UDOBNYX KRESEL
RET         2
-----------------------------------
```

Appendix 2

BORIS

1. General Description of the Basic Operating Russian Instructional System (BORIS)

BORIS is a computer-assisted instructional system which runs on the Zeus time-sharing system on a PDP-1 computer at the Institute for Mathematical Studies in the Social Sciences at Stanford University.

2. The Background System

Zeus is the name of the IMSSS time-sharing system. It operates on a Digital Equipment Corportion PDP-1. Associated with the main processor are an IBM 1301 disk unit, 12 Philco READ units with keyboard and display scope, and several Model-33 and Model-35 teletypewriters. The system includes as standard user programs a text-editor by which text-files may be generated onto the disk from the keyboard and a lister program by which hard copies of text files may be printed on a teletype.

BORIS runs as a user program under this time-sharing system and itself time-shares the students as individual micro-users under the run-time program. Figure 1 shows various programs and disk-files used in the BORIS system with their interconnections.

3. Input Preparation

The text of each day's lesson goes through four files and three pre-processors before it is available to the run-time program. Briefly, the procedure is as follows:

1. Using the text-editor, a manuscript is entered into the computer. This text-file (INPUT) consists of highly coded material using a set of predefined op-codes and combinations of English and Russian (transliterated) text. (For examples of the input coding, see Appendix 1.)

2. The INPUT is processed by Processor-I, which acts generally as a macro-expander, to produce a second text-file (SCRIPT). The SCRIPT, like the INPUT, consists of op-codes and text. The codes, however, have been reduced to a limited set of basic operations and the text now mirrors both the actual text which will be presented to the student on the teletype and those answers which will be expected of him. The audio portion of the SCRIPT is then listed on a teletype to prepare an audio script used for preparing the audio portion of the lesson.

3. The SCRIPT is processed by Processor-II to produce the run-code used by the run-time program. This code is generated onto a scratch (temporary) file while, at the same time, the SCRIPT is checked for format correctness.

4. If the SCRIPT contains no errors, the run-code is transferred from the scratch file onto a permanent run-code file by Processor III.

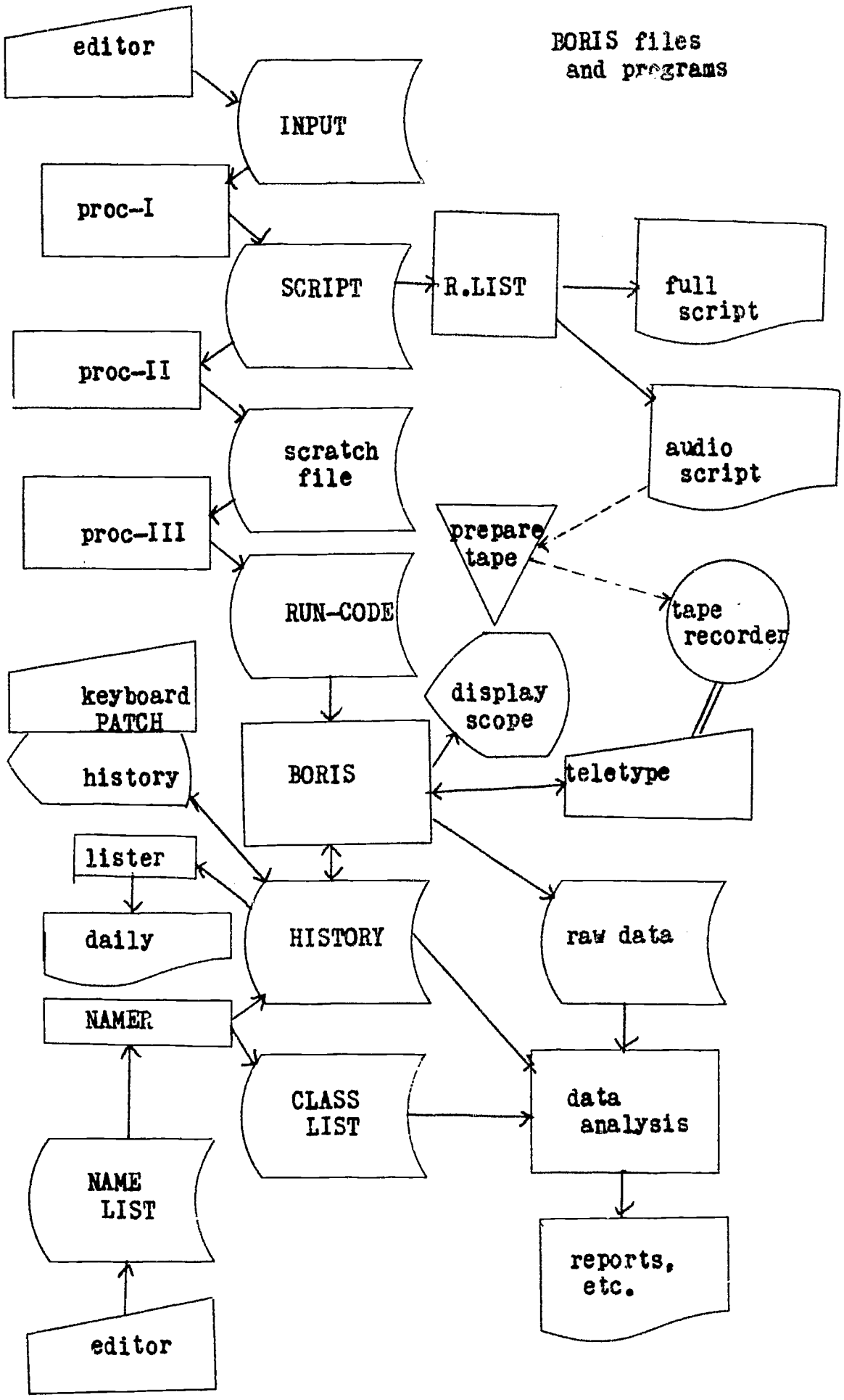
editor
INPUT
BORIS files
and programs
proc-I
SCRIPT
R.LIST
full
script
proc-II
scratch
file
audio
script
proc-III
prepare
tape
RUN-CODE
tape
recorder
keyboard
PATCH
display
scope
history
BORIS
teletype
lister
daily
HISTORY
raw data
NAMER
CLASS
LIST
data
analysis
NAME
LIST
reports,
etc.
editor

Figure 1

Copies of the INPUT, the SCRIPT, and the RUN-CODE for each lesson are read onto DEC micro-tapes for back-up purposes and the process of preparing input can be initiated at any desired point in the above chain by starting with the appropriate text.

4. Audio Preparation

Using the listed audio script prepared from the SCRIPT, a master tape of the audio portion of the lesson is recorded on channel-A of a two-track tape. This is done off-line. The master tape is mounted on one of the Ampex units with record facilities and the tape is "beeped," using a program which, under the intervention of an operator listening to a playback of channel-A and following the marked script, records a beep (four teletype characters) directly onto channel-B at the appropriate places on the tape. The first three characters of a beep are simply a sequential count and the last character is a special stop code which, as will be explained, signals the end of a message. Each discrete message of the audio portion of the lesson is thus marked with a beep. Once the master tape has been beeped, several copies of the tape are made to be used on the audio equipment at each student station.

During the course of the lesson, messages are played sequentially as they appear on the tape and are not repeated.

5. Control of the Audio

The audio units are controlled through the teletypes. Each teletype has associated with it one audio station. Five special teletype characters are used to control the audio (i.e., characters sent to the teletype act as control functions for the audio units). The five characters are:

play - turn on the recorder for playback;

silent - cause the message to not be heard over the earphones;

stop - stop the recorder;

fast forward - advance the tape quickly;

rewind - fast reverse, rewind the tape.

Zeus, the time-sharing system, has been programmed so that the stop code may be automatically duplexed; when recognized as an input character, it will generate a like output character. This feature allows the tape to be stopped as soon as the stop code recorded with each beep is recognized by Zeus and frees the run-time user program from the responsibility of sending a signal to stop the tape.

6. The Text

The text for the Russian is a combination of English and Russian. To indicate Russian text, a transliteration of the Cyrillic alphabet is used as shown in Table 1. To simplify the material, a one-to-one character transliteration is used, employing the 26 letters of the Latin alphabet and 7 additional non-alphabetic characters (< > ; :] = ←). These are all lower-case characters on the Philco keyboard and are included in the standard set of teletype characters, thus allowing accurate listings of the text-files.

TABLE 1

RUSSIAN CHARACTERS AND TRANSLITERATION

А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й
A	B	V	G	D	E	←	Q	Z	I	J

К	Л	М	Н	О	П	Р	С	Т	У	Ф
K	L	M	N	O	P	R	S	T	U	F

Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
X	C	H	W	=	:	Y	;	]	<	>

ENGLISH CHARACTERS

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

NUMERALS

0 I 2 3 4 5 6 7 8 9

OTHER CHARACTERS

' . , ? - ! _

To indicate whether a character in the text represents a Latin or a Cyrillic letter, two additional characters, / and [are used. A special version of the standard lister program available under Zeus is used that prints both of the above characters as space, but recognizes / as a signal to switch from Cyrillic (Russian) to Latin (English) and [as a signal to switch from Latin to Cyrillic. Thus, a line of text might read

[-kniga-/means -book-, but[-knigi-/means -books-.

These methods are also used by Processor-II when generating run-code from the SCRIPT text-file.

7. Input

The original input into the computer is in the form of a highly coded manuscript. (See Appendix 1.)

The INPUT is listed with the standard system lister program to obtain hard copy for proofreading and reflects exactly what is contained on the text-file.

8. Script

The script consists of the following set of 33 basic op-codes:

audio

AE audio English

The text following, which begins in English, is to be recorded on the audio tape, and a signal to play an audio message is to be generated at this point.

AR audio Russian

AFE audio future English

Same as AE, but the signal to play the tape is delayed until the teletype has positioned itself awaiting the student's response.

AFR audio future Russian

teletype output

TE type English

The following text, which begins in English, is to be typed on the teletype.

TR type Russian

RET returns

The number following this op-code specifies the number of line-feeds desired for spacing and grouping of material on the teletype at run-time.

teletype input

123 This actually represents 16 separate op-codes. The text following the op-code contains one or more sets of parentheses. The material outside the parentheses will be typed by the computer, that inside the parentheses is the required answer, e.g.,

book is [(kniga)

fill in --[on duma(1), ona duma(1a).

1 is either null or N. If null, two line-feeds will be generated in the run-code preceding the text in order to space it on the paper; if N, these line-feeds will be suppressed.

2 is one of "S, Q, C, L." These represent the four basic ways in which a response may be elicited from the student. S (simple) means that the line will be typed with an underscore to position the response and the teletype will then return and position itself at the underscores, awaiting the student response. This is used for responses to fill in blanks. Q (quick) means that the teletype will type up to the desired response and wait for the student to supply the answer. Then it will continue the line to the next response desired. This is used for responses to complete word endings. Both S- and Q-type answers require the student to start over and type the entire desired response when given additional opportunities after an error. C (character) and L (linear) are equivalent to S and Q, but signal the run-time program to supply those initial characters of the answer which are correctly typed in. Thus a student, rather than having to start over later, merely needs to try again at the point at which the error occurred.

3 is either E or R and merely indicates whether the text begins in English or in Russian.

timing and repetition control

WAT wait n

N specifies a length of time for the program to wait while the student repeats an audio message or says a sentence in Russian.

RST restart

This marks a restart point to which the lesson will return should system failure cause a student's lesson to terminate abruptly prior to completion.

TRY set try to n

Set a parameter, originally 3, which tells how many times a student must repeat subsequent responses before the program gives up and proceeds to the following lesson material.

GAA give answer after n

Set a parameter, originally 2, which tells how many times subsequent answers must be typed incorrectly before the program will give the answer.

TIM set time to n

Set a parameter, originally 10 seconds, which tells how long to wait on subsequent answers before declaring "time is up."

program flow

BEG begin

Marks the beginning of a lesson.

END end

Marks the end of a lesson.

TST test

Marks the beginning of a test section.

BLK remedial block

Marks the termination of the preceding test and the start of material which will be ignored if the student responded correctly to the material in that test.

FIN end of remedial block.

9. Run Code

The run code, unlike INPUT and SCRIPT, is not a text-file, although it consists of a combination of op-codes and text. In the run-code, there are now only 20 basic operations and the text material is stored two teletype characters per 18-bit machine word. The basic operations at run-time are:

audio	Signal to play an audio message
first-time audio	Like audio, but since it has been generated by AFE or AFR, it occurs in the middle of text and must be ignored if the student repeats a response attempt.
type	Type some text to the student.
problem statement	Type some text to the student, but note position in case problem must be repeated.
new problem	Increment problem counter.
full response	The following text is to be compared with the characters typed in by the student above the underscores. The comparison is performed character by character as the response is typed. This operation corresponds to S (simple) type response specification, and the student is required to repeat the full response should he make an error.

correctable full response	Corresponds to Q (quick) response specification. As the answer is not limited by the space indicated with the underscores, the student is allowed to type extra characters which indicate that previous characters were in error and are to be ignored. Thus, the student is allowed to correct mistakes before his response is evaluated. Naturally, for such answers, the student is required to type a special character to indicate that he is satisfied with what he has typed and is, therefore, finished with his response. Again, he is required to retype the entire answer should his first try be incorrect.
character response	Corresponds to C (character) response specification. If he makes a mistake when filling in underscores, the program will supply any initial characters which were typed correctly.
correctable character response	Corresponds to L (linear) response specification.
wait	Performs WAT.
restart	Performs RST.
set tries	Performs TRY.
give answer after	Performs GAA.
set time	Performs TIM.
finish	Terminates the lesson, gives summary information, and writes performance information on student history file.
test block	Clears an indicator which will be set should a response be typed incorrectly or timed out.
remedial block	Checks the above indicator and either continues into the remedial block or scans texts until the matching fin-block.
fin-block	Marks the end of a remedial block.
end of record	Notes the end of a record on the disk and causes additional lesson material to be read in the program buffers.
reset	Reset text-pointers to the start of the text-buffers. This is the only op-code that is not generated by Processor-II, but by the run-time program itself.

10. Processor-I

Processor-I is basically a macro expander. It reads the INPUT and converts each op-code to a series of basic SCRIPT operations, supplying standard instructions that correspond to the action desired.

11. Processor-II

The second processor is used first to convert the SCRIPT into run-code, and second to detect syntax errors in the material. Thus, for example, the unbalanced parentheses of

LE complete -[on duma(1),/but[ona dumala).

would be detected. Processor-II can be run to generate run-code and syntax check or simply to syntax check.

12. Processor-III

Processor-III stores run-code previously generated onto a scratch file at the next available area of the permanent run-code file. It also is used to garbage collect the run-code file of unneeded lesson material and to determine what lessons are currently available to the run-time program.

13. Student Histories

In much the same manner as the text of the lessons, information about the students is initially typed onto a text-file via the standard editor program and then converted to a history file accessible to the run-time program. Files and programs pertaining to this aspect of the system are:

Name List. This is a text-file containing the names (in English and in Russian) of each student in the course, as well as several additional persons, such as the writer, who also take the lessons. It also indicates the number by which each student identifies himself to the program when he signs on.

Namer. The NAME LIST is read by a NAMER program which prepares two binary files. One is the CLASS LIST used in data analysis and the second is the HISTORY file, which will contain such items as the student number and name, his current lesson, his score and the duration of his previous lesson, as well as miscellaneous information used by the system.

R.STAT. A daily report of each student's performance is prepared for immediate evaluation and to indicate which tape is to be mounted on the audio unit when that student reports for his next machine session. If a student does poorly on a lesson (under 70 per cent), he is automatically scheduled to repeat that lesson.

Patch. At any time, the current status of the student's HISTORY can be displayed on the READ scope and changed if necessary.

14. The Run-time Program

The run-time program accesses 3 disk-files (the run-code, student histories, raw data file), maintains a display on a READ scope, and uses 7 Model-35 teletypes as I/O devices.

There are two distinct sections of the run-time program. The first is the program that processes a student's lesson. This could be considered as a separate program running by itself, but is actually a micro-timed shared user. This user reads the student's sign-on as he types his designated sign-on number. It looks up his history file, determines what lesson to run, and then runs that lesson using the run-code stored on the run-code file. As it proceeds, it continually writes out raw data on a data file to be used later for analysis of performance. Finally, when the student reaches the end of the day's lesson, it updates his history, gives him a brief summary of his performance for the current lesson, and signs him off. This entire procedure is performed using re-entrant code with pointers to individual variables and calling special subroutines to perform input and output interface to the teletype.

The second part of the run-time program is a self-contained time-sharing system. It includes the features that read characters from the teletypes, sets the appropriate pointers for the user who is operating on the teletype just seen, and then allows that user to run until he either requests additional input or requests output of text to the teletype.

Thus, the micro-users run as input-activated programs in a time-sharing system. With the number of users at any given time limited to seven by the availability of teletype-audio student stations, it is possible to run using one 4K block of memory for the machine code and a second 4K block for text-buffers. The Zeus time-sharing system allows each user a maximum of 12K, so there is no problem with machine memory limitations, although a similar program currently being used at IMSSS, by swapping 4K core-loads of memory onto a high-speed drum storage unit, is able to run over 75 students at a time taking mathematics drills on Model-33 teletypes.

Appendix 3

Student Enrollment Statistics

Attrition in first-year Russian courses is high in most universities as it is at Stanford. This is probably caused by the greater difficulty of the Russian language as compared with the major Western European languages.

Table 1 shows the number of students who left the computer-based and conventional first-year Russian sections and indicates "new" students in either section (i.e., students who entered the section at the beginning of the winter or spring quarter after previous training at another institution or in an earlier year at Stanford). There was only one transfer from the computer-based section to the regular group.

Those students who chose to leave the computer-based course permanently came to explain their reasons for doing so. The following is a summary of the information at our disposal.

Student 1

The first student to drop out had many personal problems and was away from the Stanford campus for a large part of the fall quarter. He neglected all of his classes and received a grade of D+ on the fall midterm examination. After tentatively withdrawing from college, he decided to attempt to salvage his other courses by dropping Russian before the fall final examination. He was the only student who was not performing satisfactorily when he left.

Student 2

This student was in the teaching internship program at Stanford, teaching part time and studying part time. He was often late for class, because of the distance between his teaching job and Stanford and seemed under constant pressure. In spite of this, he finished the first quarter with a grade of C+. He dropped out after the first quarter.

Student 3

The third student received an A- for the first quarter final examination. A graduate student in political science, he had returned to school in the fall of 1967 after an absence of eight years. After the end of the first quarter, he decided to leave Stanford altogether.

Student 4

The fourth student received a B on the fall final examination. He abandoned Russian because he was forced to carry a large number of other courses to complete the requirements for his major.

Student 5

The fifth student was enthusiastic about computer-based instruction during the entire first quarter. In the second quarter, he expressed dissatisfaction, stating that the instructional system was a dictatorial mode of communication from the computer to him that permitted no dialogue between them. He finished the first quarter with an A and the second quarter with an A-, but did not go into the third quarter.

Student 6

This student finished the first quarter with a B and the second quarter with a C+. He then decided to leave the computer-based class to join the conventionally taught class for the third quarter. He made an F on the spring final examination, making 166 errors, more than any other student in both groups.

Student 7

An A- student in both the first and second quarters, this girl decided not to take the third quarter, since she intended to attend Stanford in Germany during the following year and felt she should concentrate on German.

Student 8

A B+ student in the first quarter, he was in great demand as a speaker on the situation in Vietnam, since his father was a prominent political leader in that country. His extracurricular commitments, combined with tensions resulting from the arrest of his family by the Saigon government, caused him to withdraw during the second quarter.

TABLE 1

Student Losses

Computer-based	Regular
First Quarter	
Beginning = 30 students End = 29 students	Beginning = 38 students End = 28 students
Second Quarter	
Beginning = 28 students (26 who had taken the first quarter plus 2 new students) End = 27 students	Beginning = 15 students (All from the original group) End = 15 students
Third Quarter	
Beginning = 24 students End = 24 students (22 who had taken all 3 quarters of the academic year, plus 2 students who joined the class at the beginning of the second quarter)	Beginning = 16 students End = 16 students (12 who had taken all 3 quarters of the academic year, plus 1 transfer from the computer-based class, plus three new students who joined at the beginning of the third quarter)

Appendix 4

First Quarter Lesson Summary Analysis

LESSONS 1 TO 46

ALL ITEM TYPES	5488 ITEMS		
AVERAGE PER CENT CORRECT	78.4		
CORRECT LATENCY IN SECS.	1.5 AVG.	1.23 S.D.	
TYPE ANSWERS TO SPOKEN RUSSIAN	307 ITEMS		
AVERAGE PER CENT CORRECT	68.5		
CORRECT LATENCY IN SECS.	0.9 AVG.	0.32 S.D.	
TRANSLATE FROM TELETYPE ENGLISH	1179 ITEMS		
AVERAGE PER CENT CORRECT	71.5		
CORRECT LATENCY IN SECS.	1.0 AVG.	0.30 S.D.	
TRANSCRIBE FROM SPOKEN RUSSIAN	534 ITEMS		
AVERAGE PER CENT CORRECT	74.9		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.62 S.D.	
TRANSFORM FROM TELETYPE RUSSIAN	369 ITEMS		
AVERAGE PER CENT CORRECT	80.0		
CORRECT LATENCY IN SECS.	1.2 AVG.	0.61 S.D.	
TRANSFORM FROM SPOKEN RUSSIAN	132 ITEMS		
AVERAGE PER CENT CORRECT	69.9		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.30 S.D.	
INFLECT TELETYPE RUSSIAN	2713 ITEMS		
AVERAGE PER CENT CORRECT	84.9		
CORRECT LATENCY IN SECS.	2.1 AVG.	1.09 S.D.	
OTHER ITEM TYPES	254 ITEMS		
AVERAGE PER CENT CORRECT	62.9		
CORRECT LATENCY IN SECS.	1.7 AVG.	3.41 S.D.	

LESSON 7 DATA FOR 28 STUDENTS

ALL ITEM TYPES	152 ITEMS		
AVERAGE PER CENT CORRECT	81.5		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.8° S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	77.0		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.35 S.D.
TRANSLATE FROM TELETYPE ENGLISH	36 ITEMS		
AVERAGE PER CENT CORRECT	69.8		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.33 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	80.4		
CORRECT LATENCY IN SECS.	1.1	AVG.	1.03 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	78.4		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.27 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	62 ITEMS		
AVERAGE PER CENT CORRECT	90.0		
CORRECT LATENCY IN SECS.	2.2	AVG.	0.87 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	84.7		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.68 S.D.

LESSON 8 DATA FOR 30 STUDENTS

ALL ITEM TYPES	152 ITEMS		
AVERAGE PER CENT CORRECT	76.5		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.11 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	63.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.43 S.D.
TRANSLATE FROM TELETYPE ENGLISH	42 ITEMS		
AVERAGE PER CENT CORRECT	68.6		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.32 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	21 ITEMS		
AVERAGE PER CENT CORRECT	72.9		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.81 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	72.6		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.56 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	57 ITEMS		
AVERAGE PER CENT CORRECT	85.9		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.02 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	95.3		
CORRECT LATENCY IN SECS.	2.5	AVG.	0.73 S.D.

LESSON 9 DATA FOR 29 STUDENTS

ALL ITEM TYPES	139 ITEMS		
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.32 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	47.9		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.38 S.D.
TRANSLATE FROM TELETYPE ENGLISH	35 ITEMS		
AVERAGE PER CENT CORRECT	73.2		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.24 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	78.7		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.31 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	25 ITEMS		
AVERAGE PER CENT CORRECT	77.9		
CORRECT LATENCY IN SECS.	1.4	AVG.	1.04 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	47 ITEMS		
AVERAGE PER CENT CORRECT	80.4		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.43 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	95.4		
CORRECT LATENCY IN SECS.	3.0	AVG.	2.01 S.D.

LESSON 10 DATA FOR 19 STUDENTS

ALL ITEM TYPES	254 ITEMS		
AVERAGE PER CENT CORRECT	81.4		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.98 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	91 ITEMS		
AVERAGE PER CENT CORRECT	74.9		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.55 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	6 ITEMS		
AVERAGE PER CENT CORRECT	42.1		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.38 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	55 ITEMS		
AVERAGE PER CENT CORRECT	85.3		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.61 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	102 ITEMS		
AVERAGE PER CENT CORRECT	87.4		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.22 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 12 DATA FOR 25 STUDENTS

ALL ITEM TYPES	166 ITEMS		
AVERAGE PER CENT CORRECT	75.3		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.00 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	57.1		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.45 S.D.
TRANSLATE FROM TELETYPE ENGLISH	24 ITEMS		
AVERAGE PER CENT CORRECT	71.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	28 ITEMS		
AVERAGE PER CENT CORRECT	70.9		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.92 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	78.8		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.23 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	74 ITEMS		
AVERAGE PER CENT CORRECT	80.5		
CORRECT LATENCY IN SECS.	2.4	AVG.	0.97 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	93.0		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.70 S.D.

LESSON 13 DATA FOR 15 STUDENTS

ALL ITEM TYPES	163 ITEMS		
AVERAGE PER CENT CORRECT	63.9		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.04 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	33 ITEMS		
AVERAGE PER CENT CORRECT	48.3		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.32 S.D.
TRANSLATE FROM TELETYPE ENGLISH	43 ITEMS		
AVERAGE PER CENT CORRECT	61.2		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.29 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	15 ITEMS		
AVERAGE PER CENT CORRECT	67.6		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.31 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.49 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	45 ITEMS		
AVERAGE PER CENT CORRECT	66.7		
CORRECT LATENCY IN SECS.	2.7	AVG.	1.15 S.D.
OTHER ITEM TYPES	9 ITEMS		
AVERAGE PER CENT CORRECT	89.6		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.30 S.D.

LESSON 14 DATA FOR 25 STUDENTS

ALL ITEM TYPES	158 ITEMS		
AVERAGE PER CENT CORRECT	74.3		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.94 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	69.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.31 S.D.
TRANSLATE FROM TELETYPE ENGLISH	42 ITEMS		
AVERAGE PER CENT CORRECT	65.3		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	81.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.16 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	85.0		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.36 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	5 ITEMS		
AVERAGE PER CENT CORRECT	65.6		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.08 S.D.
INFLECT TELETYPE RUSSIAN	70 ITEMS		
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.00 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	96.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.40 S.D.

LESSON 15 DATA FOR 29 STUDENTS

ALL ITEM TYPES	196 ITEMS		
AVERAGE PER CENT CORRECT	76.8		
CORRECT LATENCY IN SECS.	1.8	AVG.	2.28 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	4 ITEMS		
AVERAGE PER CENT CORRECT	40.5		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.43 S.D.
TRANSLATE FROM TELETYPE ENGLISH	45 ITEMS		
AVERAGE PER CENT CORRECT	71.0		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	34 ITEMS		
AVERAGE PER CENT CORRECT	68.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.23 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	89.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.25 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	84 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.25 S.D.
OTHER ITEM TYPES	11 ITEMS		
AVERAGE PER CENT CORRECT	81.1		
CORRECT LATENCY IN SECS.	5.1	AVG.	8.01 S.D.

LESSON 16 DATA FOR 30 STUDENTS

ALL ITEM TYPES	132 ITEMS		
AVERAGE PER CENT CORRECT	75.6		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.91 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	22 ITEMS		
AVERAGE PER CENT CORRECT	77.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.27 S.D.
TRANSLATE FROM TELETYPE ENGLISH	38 ITEMS		
AVERAGE PER CENT CORRECT	68.6		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.36 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	55.2		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.16 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	84.4		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.10 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	45 ITEMS		
AVERAGE PER CENT CORRECT	84.7		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.12 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	90.8		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.55 S.D.

LESSON 18 DATA FOR 29 STUDENTS

ALL ITEM TYPES	151 ITEMS		
AVERAGE PER CENT CORRECT	75.3		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.23 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	68.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.30 S.D.
TRANSLATE FROM TELETYPE ENGLISH	28 ITEMS		
AVERAGE PER CENT CORRECT	60.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.28 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	15 ITEMS		
AVERAGE PER CENT CORRECT	80.0		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.15 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	75.3		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.46 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	69 ITEMS		
AVERAGE PER CENT CORRECT	81.3		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.38 S.D.
OTHER ITEM TYPES	3 ITEMS		
AVERAGE PER CENT CORRECT	100.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.50 S.D.

LESSON 19 DATA FOR 25 STUDENTS

ALL ITEM TYPES	148 ITEMS		
AVERAGE PER CENT CORRECT	64.4		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.36 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	66.7		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.25 S.D.
TRANSLATE FROM TELETYPE ENGLISH	53 ITEMS		
AVERAGE PER CENT CORRECT	60.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.17 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	60.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.15 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.31 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	45 ITEMS		
AVERAGE PER CENT CORRECT	63.8		
CORRECT LATENCY IN SECS.	3.1	AVG.	1.67 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	78.0		
CORRECT LATENCY IN SECS.	1.4	AVG.	1.04 S.D.

LESSON 20 DATA FOR 27 STUDENTS

ALL ITEM TYPES	175 ITEMS		
AVERAGE PER CENT CORRECT	77.9		
CORRECT LATENCY IN SECS.	1.6	AVG.	2.14 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	40 ITEMS		
AVERAGE PER CENT CORRECT	66.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.29 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	74.9		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.14 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	26 ITEMS		
AVERAGE PER CENT CORRECT	79.3		
CORRECT LATENCY IN SECS.	1.	AVG.	0.97 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	89 ITEMS		
AVERAGE PER CENT CORRECT	84.2		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.98 S.D.
OTHER ITEM TYPES	1 ITEMS		
AVERAGE PER CENT CORRECT	2.0		
CORRECT LATENCY IN SECS.	27.0	AVG.	0.00 S.D.

LESSON 21 DATA FOR 17 STUDENTS

ALL ITEM TYPES	186 ITEMS		
AVERAGE PER CENT CORRECT	78.8		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.18 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	72.3		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.21 S.D.
TRANSLATE FROM TELETYPE ENGLISH	50 ITEMS		
AVERAGE PER CENT CORRECT	71.2		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	80.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.10 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	82.4		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.26 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	88.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.17 S.D.
INFLECT TELETYPE RUSSIAN	87 ITEMS		
AVERAGE PER CENT CORRECT	81.7		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.21 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	94.1		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.37 S.D.

LESSON 22 DATA FOR 28 STUDENTS

ALL ITEM TYPES	162 ITEMS		
AVERAGE PER CENT CORRECT	75.7		
CORRECT LATENCY IN SECS.	1.5	AVG.	1.04 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	65.7		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.19 S.D.
TRANSLATE FROM TELETYPE ENGLISH	45 ITEMS		
AVERAGE PER CENT CORRECT	72.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.29 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	77.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.19 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	87.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.29 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	69 ITEMS		
AVERAGE PER CENT CORRECT	75.7		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.06 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	94.6		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.63 S.D.

LESSON 23 DATA FOR 28 STUDENTS

ALL ITEM TYPES	179 ITEMS		
AVERAGE PER CENT CORRECT	84.5		
CORRECT LATENCY IN SECS.	1.5 AVG.	0.88 S.D.	
TYPE ANSWERS TO SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	78.6		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.25 S.D.	
TRANSLATE FROM TELETYPE ENGLISH	10 ITEMS		
AVERAGE PER CENT CORRECT	71.4		
CORRECT LATENCY IN SECS.	0.9 AVG.	0.16 S.D.	
TRANSCRIBE FROM SPOKEN RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	73.4		
CORRECT LATENCY IN SECS.	0.7 AVG.	0.17 S.D.	
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.27 S.D.	
TRANSFORM FROM SPOKEN RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	91.1		
CORRECT LATENCY IN SECS.	0.6 AVG.	0.21 S.D.	
INFLECT TELETYPE RUSSIAN	117 ITEMS		
AVERAGE PER CENT CORRECT	87.3		
CORRECT LATENCY IN SECS.	1.9 AVG.	0.87 S.D.	
OTHER ITEM TYPES	11 ITEMS		
AVERAGE PER CENT CORRECT	93.5		
CORRECT LATENCY IN SECS.	1.3 AVG.	0.71 S.D.	

LESSON 24 DATA FOR 16 STUDENTS

ALL ITEM TYPES	228 ITEMS		
AVERAGE PER CENT CORRECT	80.6		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.84 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	56.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSLATE FROM TELETYPE ENGLISH	40 ITEMS		
AVERAGE PER CENT CORRECT	61.7		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.27 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	24 ITEMS		
AVERAGE PER CENT CORRECT	81.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	85.7		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.41 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	83.5		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.39 S.D.
INFLECT TELETYPE RUSSIAN	127 ITEMS		
AVERAGE PER CENT CORRECT	86.7		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.87 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	86.3		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.31 S.D.

LESSON 25 DATA FOR 14 STUDENTS

ALL ITEM TYPES	209 ITEMS		
AVERAGE PER CENT CORRECT	82.2		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.81 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	26 ITEMS		
AVERAGE PER CENT CORRECT	58.2		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	44 ITEMS		
AVERAGE PER CENT CORRECT	73.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.18 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	82.9		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.25 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	78.6		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.25 S.D.
INFLECT TELETYPE RUSSIAN	119 ITEMS		
AVERAGE PER CENT CORRECT	91.1		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.93 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 27 DATA FOR 27 STUDENTS

ALL ITEM TYPES	169 ITEMS		
AVERAGE PER CENT CORRECT	81.4		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.90 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	75.2		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.31 S.D.
TRANSLATE FROM TELETYPE ENGLISH	32 ITEMS		
AVERAGE PER CENT CORRECT	67.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	77.5		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	93.8		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.12 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	92.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.06 S.D.
INFLECT TELETYPE RUSSIAN	99 ITEMS		
AVERAGE PER CENT CORRECT	85.4		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.95 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	94.9		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.73 S.D.

LESSON 29 DATA FOR 21 STUDENTS

ALL ITEM TYPES	171 ITEMS		
AVERAGE PER CENT CORRECT	82.4		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.91 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	63.3		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.17 S.D.
TRANSLATE FROM TELETYPE ENGLISH	16 ITEMS		
AVERAGE PER CENT CORRECT	60.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.27 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	29 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.18 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	96.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.48 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	99 ITEMS		
AVERAGE PER CENT CORRECT	86.4		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.91 S.D.
OTHER ITEM TYPES	4 ITEMS		
AVERAGE PER CENT CORRECT	98.8		
CORRECT LATENCY IN SECS.	2.2	AVG.	0.54 S.D.

LESSON 30 DATA FOR 30 STUDENTS

ALL ITEM TYPES	203 ITEMS		
AVERAGE PER CENT CORRECT	85.5		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.01 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	85.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.16 S.D.
TRANSLATE FROM TELETYPE ENGLISH	34 ITEMS		
AVERAGE PER CENT CORRECT	81.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	25 ITEMS		
AVERAGE PER CENT CORRECT	81.1		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.90 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	90.0		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.44 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	5 ITEMS		
AVERAGE PER CENT CORRECT	86.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.11 S.D.
INFLECT TELETYPE RUSSIAN	107 ITEMS		
AVERAGE PER CENT CORRECT	86.2		
CORRECT LATENCY IN SECS.	2.2	AVG.	0.89 S.D.
OTHER ITEM TYPES	11 ITEMS		
AVERAGE PER CENT CORRECT	97.3		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.76 S.D.

LESSON 32 DATA FOR 23 STUDENTS

ALL ITEM TYPES	144 ITEMS		
AVERAGE PER CENT CORRECT	75.8		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.27 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	73.2		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.26 S.D.
TRANSLATE FROM TELETYPE ENGLISH	19 ITEMS		
AVERAGE PER CENT CORRECT	83.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.43 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	64.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.19 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	72.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.12 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	58.9		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.25 S.D.
INFLECT TELETYPE RUSSIAN	74 ITEMS		
AVERAGE PER CENT CORRECT	78.9		
CORRECT LATENCY IN SECS.	2.7	AVG.	1.17 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	93.1		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.54 S.D.

LESSON 33 DATA FOR 29 STUDENTS

ALL ITEM TYPES	156 ITEMS		
AVERAGE PER CENT CORRECT	72.4		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.09 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	62.6		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.18 S.D.
TRANSLATE FROM TELETYPE ENGLISH	16 ITEMS		
AVERAGE PER CENT CORRECT	70.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.24 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	78.9		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.14 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	62.8		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.19 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	55.8		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.09 S.D.
INFLECT TELETYPE RUSSIAN	88 ITEMS		
AVERAGE PER CENT CORRECT	77.0		
CORRECT LATENCY IN SECS.	2.2	AVG.	1.12 S.D.
OTHER ITEM TYPES	2 ITEMS		
AVERAGE PER CENT CORRECT	100.0		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.78 S.D.

LESSON 34 DATA FOR 21 STUDENTS

ALL ITEM TYPES	140 ITEMS		
AVERAGE PER CENT CORRECT	83.7		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.89 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	85.1		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.20 S.D.
TRANSLATE FROM TELETYPE ENGLISH	15 ITEMS		
AVERAGE PER CENT CORRECT	76.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.26 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	78.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.13 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.32 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	86 ITEMS		
AVERAGE PER CENT CORRECT	85.1		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.95 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	84.9		
CORRECT LATENCY IN SECS.	3.8	AVG.	7.57 S.D.

LESSON 35 DATA FOR 26 STUDENTS

ALL ITEM TYPES	127 ITEMS		
AVERAGE PER CENT CORRECT	79.9		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.88 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	84.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.06 S.D.
TRANSLATE FROM TELETYPE ENGLISH	2 ITEMS		
AVERAGE PER CENT CORRECT	48.1		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.07 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	42 ITEMS		
AVERAGE PER CENT CORRECT	77.3		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.14 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	78.7		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.51 S.D.
INFLECT TELETYPE RUSSIAN	60 ITEMS		
AVERAGE PER CENT CORRECT	81.9		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.96 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	87.4		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.41 S.D.

LESSON 37 DATA FOR 20 STUDENTS

ALL ITEM TYPES	20 ITEMS		
AVERAGE PER CENT CORRECT	41.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.13 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	20 ITEMS		
AVERAGE PER CENT CORRECT	41.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.13 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	0 ITEMS		
OTHER ITEM TYPES	0 ITEMS		

LESSON 39 DATA FOR 27 STUDENTS

ALL ITEM TYPES	124 ITEMS		
AVERAGE PER CENT CORRECT	87.6		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.76 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	85.4		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.30 S.D.
TRANSLATE FROM TELETYPE ENGLISH	26 ITEMS		
AVERAGE PER CENT CORRECT	87.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.17 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	0.5	AVG.	0.13 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	81.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.12 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	47 ITEMS		
AVERAGE PER CENT CORRECT	90.6		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.62 S.D.
OTHER ITEM TYPES	16 ITEMS		
AVERAGE PER CENT CORRECT	88.0		
CORRECT LATENCY IN SECS.	1.5	AVG.	1.40 S.D.

LESSON 40 DATA FOR 25 STUDENTS

ALL ITEM TYPES	113 ITEMS		
AVERAGE PER CENT CORRECT	87.2		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.84 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	15 ITEMS		
AVERAGE PER CENT CORRECT	83.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.30 S.D.
TRANSLATE FROM TELETYPE ENGLISH	12 ITEMS		
AVERAGE PER CENT CORRECT	69.3		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.14 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	88.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.11 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	88.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.06 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	85.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.10 S.D.
INFLECT TELETYPE RUSSIAN	61 ITEMS		
AVERAGE PER CENT CORRECT	91.1		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.87 S.D.
OTHER ITEM TYPES	3 ITEMS		
AVERAGE PER CENT CORRECT	89.3		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.93 S.D.

LESSON 41 DATA FOR 28 STUDENTS

ALL ITEM TYPES	134 ITEMS		
AVERAGE PER CENT CORRECT	87.2		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.94 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	4 ITEMS		
AVERAGE PER CENT CORRECT	78.6		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.15 S.D.
TRANSLATE FROM TELETYPE ENGLISH	15 ITEMS		
AVERAGE PER CENT CORRECT	91.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.21 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	76.5		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.11 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	76.2		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.15 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	90.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.47 S.D.
INFLECT TELETYPE RUSSIAN	82 ITEMS		
AVERAGE PER CENT CORRECT	89.2		
CORRECT LATENCY IN SECS.	2.0	AVG.	0.79 S.D.
OTHER ITEM TYPES	10 ITEMS		
AVERAGE PER CENT CORRECT	87.9		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.33 S.D.

LESSON 42 DATA FOR 28 STUDENTS

ALL ITEM TYPES	123 ITEMS		
AVERAGE PER CENT CORRECT	87.5		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.97 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	69 ITEMS		
AVERAGE PER CENT CORRECT	81.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	54 ITEMS		
AVERAGE PER CENT CORRECT	94.6		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.21 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 43 DATA FOR 29 STUDENTS

ALL ITEM TYPES	163 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.56 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	104 ITEMS		
AVERAGE PER CENT CORRECT	75.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.27 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	59 ITEMS		
AVERAGE PER CENT CORRECT	95.9		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.74 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 44 DATA FOR 29 STUDENTS

ALL ITEM TYPES	128 ITEMS		
AVERAGE PER CENT CORRECT	89.1		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.51 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	58 ITEMS		
AVERAGE PER CENT CORRECT	88.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	65.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.15 S.D.
INFLECT TELETYPE RUSSIAN	51 ITEMS		
AVERAGE PER CENT CORRECT	97.8		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.63 S.D.
OTHER ITEM TYPES	1 ITEMS		
AVERAGE PER CENT CORRECT	96.6		
CORRECT LATENCY IN SECS.	2.9	AVG.	0.00 S.D.

LESSON 45 DATA FOR 29 STUDENTS

ALL ITEM TYPES	277 ITEMS		
AVERAGE PER CENT CORRECT	78.6		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.15 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	25 ITEMS		
AVERAGE PER CENT CORRECT	74.6		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.14 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	26 ITEMS		
AVERAGE PER CENT CORRECT	67.4		
CORRECT LATENCY IN SECS.	2.1	AVG.	0.51 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	51.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.35 S.D.
INFLECT TELETYPE RUSSIAN	208 ITEMS		
AVERAGE PER CENT CORRECT	82.8		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.15 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 46 DATA FOR 22 STUDENTS

ALL ITEM TYPES	266 ITEMS		
AVERAGE PER CENT CORRECT	87.0		
CORRECT LATENCY IN SECS.	1.8 AVG.	0.92 S.D.	
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	25 ITEMS		
AVERAGE PER CENT CORRECT	70.0		
CORRECT LATENCY IN SECS.	0.9 AVG.	0.23 S.D.	
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	64.6		
CORRECT LATENCY IN SECS.	0.7 AVG.	0.11 S.D.	
INFLECT TELETYPE RUSSIAN	230 ITEMS		
AVERAGE PER CENT CORRECT	89.8		
CORRECT LATENCY IN SECS.	1.9 AVG.	0.92 S.D.	
OTHER ITEM TYPES	1 ITEMS		
AVERAGE PER CENT CORRECT	95.5		
CORRECT LATENCY IN SECS.	2.3 AVG.	0.00 S.D.	

Appendix 5

Second Quarter Lesson Summary Analysis

LESSONS 47 TO 92

ALL ITEM TYPES	5242 ITEMS		
AVERAGE PER CENT CORRECT	83.4		
CORRECT LATENCY IN SECS.	1.5 AVG.	1.11 S.D.	
TYPE ANSWERS TO SPOKEN RUSSIAN	310 ITEMS		
AVERAGE PER CENT CORRECT	75.0		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.42 S.D.	
TRANSLATE FROM TELETYPE ENGLISH	1084 ITEMS		
AVERAGE PER CENT CORRECT	81.0		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.26 S.D.	
TRANSCRIBE FROM SPOKEN RUSSIAN	275 ITEMS		
AVERAGE PER CENT CORRECT	90.8		
CORRECT LATENCY IN SECS.	0.6 AVG.	0.17 S.D.	
TRANSFORM FROM TELETYPE RUSSIAN	378 ITEMS		
AVERAGE PER CENT CORRECT	82.5		
CORRECT LATENCY IN SECS.	0.9 AVG.	0.33 S.D.	
TRANSFORM FROM SPOKEN RUSSIAN	92 ITEMS		
AVERAGE PER CENT CORRECT	81.7		
CORRECT LATENCY IN SECS.	0.8 AVG.	0.24 S.D.	
INFLECT TELETYPE RUSSIAN	2752 ITEMS		
AVERAGE PER CENT CORRECT	84.6		
CORRECT LATENCY IN SECS.	2.1 AVG.	1.18 S.D.	
OTHER ITEM TYPES	351 ITEMS		
AVERAGE PER CENT CORRECT	84.8		
CORRECT LATENCY IN SECS.	2.2 AVG.	1.05 S.D.	

LESSON 53 DATA FOR 26 STUDENTS

ALL ITEM TYPES	145 ITEMS		
AVERAGE PER CENT CORRECT	87.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.13 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	90.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.24 S.D.
TRANSLATE FROM TELETYPE ENGLISH	22 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.34 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	90.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.18 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	100.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.14 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	6 ITEMS		
AVERAGE PER CENT CORRECT	93.0		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.09 S.D.
INFLECT TELETYPE RUSSIAN	87 ITEMS		
AVERAGE PER CENT CORRECT	85.8		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.16 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	97.1		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.76 S.D.

LESSON 55 DATA FOR 26 STUDENTS

ALL ITEM TYPES	137 ITEMS		
AVERAGE PER CENT CORRECT	84.4		
CORRECT LATENCY IN SECS.	1.4	AVG.	1.04 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	65.4		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.34 S.D.
TRANSLATE FROM TELETYPE ENGLISH	28 ITEMS		
AVERAGE PER CENT CORRECT	80.8		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.22 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	85.9		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.16 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	83.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.34 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	80.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.21 S.D.
INFLECT TELETYPE RUSSIAN	61 ITEMS		
AVERAGE PER CENT CORRECT	88.5		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.17 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	92.3		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.78 S.D.

LESSON 56 DATA FOR 27 STUDENTS

ALL ITEM TYPES	156 ITEMS		
AVERAGE PER CENT CORRECT	84.2		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.61 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.14 S.D.
TRANSLATE FROM TELETYPE ENGLISH	20 ITEMS		
AVERAGE PER CENT CORRECT	87.6		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.25 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	19 ITEMS		
AVERAGE PER CENT CORRECT	83.4		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.16 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	86.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.13 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	83.0		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.11 S.D.
INFLECT TELETYPE RUSSIAN	88 ITEMS		
AVERAGE PER CENT CORRECT	81.9		
CORRECT LATENCY IN SECS.	3.1	AVG.	1.51 S.D.
OTHER ITEM TYPES	10 ITEMS		
AVERAGE PER CENT CORRECT	98.2		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.59 S.D.

LESSON 57 DATA FOR 17 STUDENTS

ALL ITEM TYPES	103 ITEMS		
AVERAGE PER CENT CORRECT	82.4		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.43 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	52.0		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.33 S.D.
TRANSLATE FROM TELETYPE ENGLISH	12 ITEMS		
AVERAGE PER CENT CORRECT	78.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.26 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	88.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.12 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	94.1		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.06 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	62.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.06 S.D.
INFLECT TELETYPE RUSSIAN	52 ITEMS		
AVERAGE PER CENT CORRECT	88.2		
CORRECT LATENCY IN SECS.	2.7	AVG.	1.37 S.D.
OTHER ITEM TYPES	12 ITEMS		
AVERAGE PER CENT CORRECT	92.1		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.45 S.D.

LESSON 58 DATA FOR 15 STUDENTS

ALL ITEM TYPES	190 ITEMS		
AVERAGE PER CENT CORRECT	82.5		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.77 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	72 ITEMS		
AVERAGE PER CENT CORRECT	83.5		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.21 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.06 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	113 ITEMS		
AVERAGE PER CENT CORRECT	82.1		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.89 S.D.
OTHER ITEM TYPES	2 ITEMS		
AVERAGE PER CENT CORRECT	56.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.85 S.D.

LESSON 59 DATA FOR 28 STUDENTS

ALL ITEM TYPES	116 ITEMS		
AVERAGE PER CENT CORRECT	83.7		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.42 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	6 ITEMS		
AVERAGE PER CENT CORRECT	68.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.24 S.D.
TRANSLATE FROM TELETYPE ENGLISH	26 ITEMS		
AVERAGE PER CENT CORRECT	73.9		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.30 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	84.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	83.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.35 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	55 ITEMS		
AVERAGE PER CENT CORRECT	87.3		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.37 S.D.
OTHER ITEM TYPES	13 ITEMS		
AVERAGE PER CENT CORRECT	95.6		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.82 S.D.

LESSON 60 DATA FOR 28 STUDENTS

ALL ITEM TYPES	131 ITEMS		
AVERAGE PER CENT CORRECT	83.2		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.34 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	70.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.26 S.D.
TRANSLATE FROM TELETYPE ENGLISH	22 ITEMS		
AVERAGE PER CENT CORRECT	84.9		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.21 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	91.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.06 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	22 ITEMS		
AVERAGE PER CENT CORRECT	89.4		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.30 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	62 ITEMS		
AVERAGE PER CENT CORRECT	82.4		
CORRECT LATENCY IN SECS.	2.7	AVG.	1.35 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	96.4		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.38 S.D.

LESSON 61 DATA FOR 28 STUDENTS

ALL ITEM TYPES		117	ITEMS	
	AVERAGE PER CENT CORRECT	86.8		
	CORRECT LATENCY IN SECS.	1.2	AVG.	0.96 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN		22	ITEMS	
	AVERAGE PER CENT CORRECT	77.6		
	CORRECT LATENCY IN SECS.	0.8	AVG.	0.29 S.D.
TRANSLATE FROM TELETYPE ENGLISH		12	ITEMS	
	AVERAGE PER CENT CORRECT	81.8		
	CORRECT LATENCY IN SECS.	0.7	AVG.	0.19 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN		7	ITEMS	
	AVERAGE PER CENT CORRECT	90.3		
	CORRECT LATENCY IN SECS.	0.7	AVG.	0.08 S.D.
TRANSFORM FROM TELETYPE RUSSIAN		18	ITEMS	
	AVERAGE PER CENT CORRECT	91.1		
	CORRECT LATENCY IN SECS.	0.8	AVG.	0.15 S.D.
TRANSFORM FROM SPOKEN RUSSIAN		6	ITEMS	
	AVERAGE PER CENT CORRECT	92.3		
	CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
INFLECT TELETYPE RUSSIAN		46	ITEMS	
	AVERAGE PER CENT CORRECT	88.9		
	CORRECT LATENCY IN SECS.	1.6	AVG.	1.05 S.D.
OTHER ITEM TYPES		6	ITEMS	
	AVERAGE PER CENT CORRECT	91.7		
	CORRECT LATENCY IN SECS.	3.2	AVG.	1.55 S.D.

LESSON 62 DATA FOR 28 STUDENTS

ALL ITEM TYPES	135	ITEMS		
AVERAGE PER CENT CORRECT	83.4			
CORRECT LATENCY IN SECS.	1.7	AVG.	1.10	S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	12	ITEMS		
AVERAGE PER CENT CORRECT	72.6			
CORRECT LATENCY IN SECS.	0.8	AVG.	0.35	S.D.
TRANSLATE FROM TELETYPE ENGLISH	11	ITEMS		
AVERAGE PER CENT CORRECT	88.0			
CORRECT LATENCY IN SECS.	0.7	AVG.	0.15	S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	4	ITEMS		
AVERAGE PER CENT CORRECT	81.3			
CORRECT LATENCY IN SECS.	0.6	AVG.	0.13	S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9	ITEMS		
AVERAGE PER CENT CORRECT	77.4			
CORRECT LATENCY IN SECS.	1.0	AVG.	0.35	S.D.
TRANSFORM FROM SPOKEN RUSSIAN	14	ITEMS		
AVERAGE PER CENT CORRECT	89.0			
CORRECT LATENCY IN SECS.	0.8	AVG.	0.16	S.D.
INFLECT TELETYPE RUSSIAN	77	ITEMS		
AVERAGE PER CENT CORRECT	83.9			
CORRECT LATENCY IN SECS.	2.2	AVG.	1.11	S.D.
OTHER ITEM TYPES	8	ITEMS		
AVERAGE PER CENT CORRECT	86.2			
CORRECT LATENCY IN SECS.	2.3	AVG.	0.77	S.D.

LESSON 63 DATA FOR 28 STUDENTS

ALL ITEM TYPES	127 ITEMS		
AVERAGE PER CENT CORRECT	80.2		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.80 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	29 ITEMS		
AVERAGE PER CENT CORRECT	78.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.48 S.D.
TRANSLATE FROM TELETYPE ENGLISH	42 ITEMS		
AVERAGE PER CENT CORRECT	79.5		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	94.2		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.12 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	91.7		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.55 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	41 ITEMS		
AVERAGE PER CENT CORRECT	79.4		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.10 S.D.
OTHER ITEM TYPES	4 ITEMS		
AVERAGE PER CENT CORRECT	75.6		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.62 S.D.

LESSON 64 DATA FOR 28 STUDENTS

ALL ITEM TYPES	169 ITEMS		
AVERAGE PER CENT CORRECT	84.3		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.51 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	70.9		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.18 S.D.
TRANSLATE FROM TELETYPE ENGLISH	26 ITEMS		
AVERAGE PER CENT CORRECT	89.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	89.3		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.15 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	24 ITEMS		
AVERAGE PER CENT CORRECT	94.6		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.27 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	99 ITEMS		
AVERAGE PER CENT CORRECT	81.7		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.56 S.D.
OTHER ITEM TYPES	0 ITEMS		

LESSON 65 DATA FOR 28 STUDENTS

ALL ITEM TYPES	148 ITEMS		
AVERAGE PER CENT CORRECT	86.9		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.10 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	30 ITEMS		
AVERAGE PER CENT CORRECT	86.3		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	94.2		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.24 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	87.9		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.18 S.D.
INFLECT TELETYPE RUSSIAN	93 ITEMS		
AVERAGE PER CENT CORRECT	86.9		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.12 S.D.
OTHER ITEM TYPES	9 ITEMS		
AVERAGE PER CENT CORRECT	81.8		
CORRECT LATENCY IN SECS.	2.5	AVG.	0.87 S.D.

LESSON 66 DATA FOR 26 STUDENTS

ALL ITEM TYPES	128 ITEMS			
AVERAGE PER CENT CORRECT	81.7			
CORRECT LATENCY IN SECS.	1.5	AVG.	0.91	S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	7 ITEMS			
AVERAGE PER CENT CORRECT	80.8			
CORRECT LATENCY IN SECS.	1.2	AVG.	0.46	S.D.
TRANSLATE FROM TELETYPE ENGLISH	29 ITEMS			
AVERAGE PER CENT CORRECT	80.6			
CORRECT LATENCY IN SECS.	0.8	AVG.	0.21	S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	3 ITEMS			
AVERAGE PER CENT CORRECT	94.9			
CORRECT LATENCY IN SECS.	0.7	AVG.	0.23	S.D.
TRANSFORM FROM TELETYPE RUSSIAN	4 ITEMS			
AVERAGE PER CENT CORRECT	76.0			
CORRECT LATENCY IN SECS.	1.2	AVG.	0.41	S.D.
TRANSFORM FROM SPOKEN RUSSIAN	7 ITEMS			
AVERAGE PER CENT CORRECT	69.8			
CORRECT LATENCY IN SECS.	0.8	AVG.	0.20	S.D.
INFLECT TELETYPE RUSSIAN	78 ITEMS			
AVERAGE PER CENT CORRECT	83.0			
CORRECT LATENCY IN SECS.	1.9	AVG.	0.92	S.D.
OTHER ITEM TYPES	0 ITEMS			

LESSON 67 DATA FOR 22 STUDENTS

ALL ITEM TYPES	149 ITEMS		
AVERAGE PER CENT CORRECT	82.5		
CORRECT LATENCY IN SECS.	1.5	AVG.	1.23 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	80.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.23 S.D.
TRANSLATE FROM TELETYPE ENGLISH	29 ITEMS		
AVERAGE PER CENT CORRECT	75.9		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	5 ITEMS		
AVERAGE PER CENT CORRECT	96.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.07 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	89.8		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.42 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	1 ITEMS		
AVERAGE PER CENT CORRECT	86.4		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.00 S.D.
INFLECT TELETYPE RUSSIAN	79 ITEMS		
AVERAGE PER CENT CORRECT	84.7		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.40 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	70.9		
CORRECT LATENCY IN SECS.	2.0	AVG.	1.03 S.D.

LESSON 69 DATA FOR 28 STUDENTS

ALL ITEM TYPES	169 ITEMS		
AVERAGE PER CENT CORRECT	83.5		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.16 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	74.1		
CORRECT LATENCY IN SECS.	1.2	AVG.	1.25 S.D.
TRANSLATE FROM TELETYPE ENGLISH	15 ITEMS		
AVERAGE PER CENT CORRECT	79.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	92.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.08 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	75.5		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.55 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	107 ITEMS		
AVERAGE PER CENT CORRECT	85.2		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.04 S.D.
OTHER ITEM TYPES	7 ITEMS		
AVERAGE PER CENT CORRECT	95.4		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.59 S.D.

LESSON 70 DATA FOR 28 STUDENTS

ALL ITEM TYPES	138 ITEMS		
AVERAGE PER CENT CORRECT	84.3		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.17 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	75.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.33 S.D.
TRANSLATE FROM TELETYPE ENGLISH	18 ITEMS		
AVERAGE PER CENT CORRECT	78.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.31 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	92.9		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.09 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	84.9		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.29 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	67 ITEMS		
AVERAGE PER CENT CORRECT	85.6		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.26 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	92.9		
CORRECT LATENCY IN SECS.	2.1	AVG.	0.86 S.D.

LESSON 71 DATA FOR 27 STUDENTS

ALL ITEM TYPES	126 ITEMS		
AVERAGE PER CENT CORRECT	84.5		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.27 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	79.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSLATE FROM TELETYPE ENGLISH	21 ITEMS		
AVERAGE PER CENT CORRECT	90.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.16 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	88.1		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.23 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	82.1		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.29 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	42 ITEMS		
AVERAGE PER CENT CORRECT	83.2		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.47 S.D.
OTHER ITEM TYPES	26 ITEMS		
AVERAGE PER CENT CORRECT	83.3		
CORRECT LATENCY IN SECS.	2.3	AVG.	1.18 S.D.

LESSON 72 DATA FOR 25 STUDENTS

ALL ITEM TYPES	134 ITEMS		
AVERAGE PER CENT CORRECT	84.1		
CORRECT LATENCY IN SECS.	1.3	AVG.	1.02 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.28 S.D.
TRANSLATE FROM TELETYPE ENGLISH	13 ITEMS		
AVERAGE PER CENT CORRECT	85.2		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.24 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	87.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.15 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	29 ITEMS		
AVERAGE PER CENT CORRECT	85.0		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.31 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	50 ITEMS		
AVERAGE PER CENT CORRECT	81.4		
CORRECT LATENCY IN SECS.	2.2	AVG.	1.14 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	97.3		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.62 S.D.

LESSON 73 DATA FOR 26 STUDENTS

ALL ITEM TYPES	143 ITEMS		
AVERAGE PER CENT CORRECT	84.5		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.13 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	82.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.07 S.D.
TRANSLATE FROM TELETYPE ENGLISH	33 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.22 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	94.4		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	87.5		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	76 ITEMS		
AVERAGE PER CENT CORRECT	82.5		
CORRECT LATENCY IN SECS.	2.2	AVG.	1.16 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	94.9		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.54 S.D.

LESSON 74 DATA FOR 27 STUDENTS

ALL ITEM TYPES	131 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.40 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	4 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.32 S.D.
TRANSLATE FROM TELETYPE ENGLISH	14 ITEMS		
AVERAGE PER CENT CORRECT	90.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	96.3		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.11 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	24 ITEMS		
AVERAGE PER CENT CORRECT	70.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.18 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	66 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	2.6	AVG.	1.48 S.D.
OTHER ITEM TYPES	10 ITEMS		
AVERAGE PER CENT CORRECT	93.3		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.58 S.D.

LESSON 75 DATA FOR 24 STUDENTS

ALL ITEM TYPES	123 ITEMS		
AVERAGE PER CENT CORRECT	81.9		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.93 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	64.1		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.30 S.D.
TRANSLATE FROM TELETYPE ENGLISH	40 ITEMS		
AVERAGE PER CENT CORRECT	87.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.25 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	90.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.07 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	37 ITEMS		
AVERAGE PER CENT CORRECT	77.7		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.17 S.D.
OTHER ITEM TYPES	19 ITEMS		
AVERAGE PER CENT CORRECT	90.8		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.95 S.D.

LESSON 76 DATA FOR 21 STUDENTS

ALL ITEM TYPES	118 ITEMS		
AVERAGE PER CENT CORRECT	83.7		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.71 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	75.5		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.23 S.D.
TRANSLATE FROM TELETYPE ENGLISH	13 ITEMS		
AVERAGE PER CENT CORRECT	87.2		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.51 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	93.1		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.17 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	43 ITEMS		
AVERAGE PER CENT CORRECT	80.8		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.41 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	25 ITEMS		
AVERAGE PER CENT CORRECT	86.8		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.98 S.D.
OTHER ITEM TYPES	8 ITEMS		
AVERAGE PER CENT CORRECT	92.9		
CORRECT LATENCY IN SECS.	2.1	AVG.	0.96 S.D.

LESSON 77 DATA FOR 24 STUDENTS

ALL ITEM TYPES	122 ITEMS		
AVERAGE PER CENT CORRECT	86.3		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.74 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	79.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.12 S.D.
TRANSLATE FROM TELETYPE ENGLISH	34 ITEMS		
AVERAGE PER CENT CORRECT	84.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.39 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	91.1		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.08 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	84.0		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.26 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	21 ITEMS		
AVERAGE PER CENT CORRECT	94.6		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.87 S.D.
OTHER ITEM TYPES	27 ITEMS		
AVERAGE PER CENT CORRECT	84.7		
CORRECT LATENCY IN SECS.	1.8	AVG.	0.89 S.D.

LESSON 79 DATA FOR 23 STUDENTS

ALL ITEM TYPES	143 ITEMS		
AVERAGE PER CENT CORRECT	82.7		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.27 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	58.0		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.26 S.D.
TRANSLATE FROM TELETYPE ENGLISH	19 ITEMS		
AVERAGE PER CENT CORRECT	75.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.31 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	95.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.23 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	87.5		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.26 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	96 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	2.5	AVG.	1.17 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	90.6		
CORRECT LATENCY IN SECS.	1.8	AVG.	0.38 S.D.

LESSON 80 DATA FOR 22 STUDENTS

ALL ITEM TYPES	125 ITEMS		
AVERAGE PER CENT CORRECT	79.0		
CORRECT LATENCY IN SECS.	1.4	AVG.	1.15 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	71.2		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.27 S.D.
TRANSLATE FROM TELETYPE ENGLISH	27 ITEMS		
AVERAGE PER CENT CORRECT	72.4		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.38 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	89.3		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.27 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	65.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.31 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	38 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	2.0	AVG.	1.30 S.D.
OTHER ITEM TYPES	21 ITEMS		
AVERAGE PER CENT CORRECT	84.9		
CORRECT LATENCY IN SECS.	2.6	AVG.	0.96 S.D.

LESSON 81 DATA FOR 18 STUDENTS

ALL ITEM TYPES	153 ITEMS		
AVERAGE PER CENT CORRECT	84.0		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.81 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	21 ITEMS		
AVERAGE PER CENT CORRECT	75.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.35 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.28 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	80.9		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.19 S.D.
INFLECT TELETYPE RUSSIAN	101 ITEMS		
AVERAGE PER CENT CORRECT	84.8		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.81 S.D.
OTHER ITEM TYPES	14 ITEMS		
AVERAGE PER CENT CORRECT	90.5		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.75 S.D.

LESSON 82 DATA FOR 26 STUDENTS

ALL ITEM TYPES	117 ITEMS		
AVERAGE PER CENT CORRECT	81.3		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.93 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	69.3		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.07 S.D.
TRANSLATE FROM TELETYPE ENGLISH	47 ITEMS		
AVERAGE PER CENT CORRECT	79.1		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.33 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	6 ITEMS		
AVERAGE PER CENT CORRECT	66.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.29 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	59 ITEMS		
AVERAGE PER CENT CORRECT	85.7		
CORRECT LATENCY IN SECS.	1.7	AVG.	0.90 S.D.
OTHER ITEM TYPES	3 ITEMS		
AVERAGE PER CENT CORRECT	68.0		
CORRECT LATENCY IN SECS.	4.0	AVG.	1.31 S.D.

LESSON 83 DATA FOR 22 STUDENTS

ALL ITEM TYPES	119 ITEMS		
AVERAGE PER CENT CORRECT	78.6		
CORRECT LATENCY IN SECS.	1.4	AVG.	1.00 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	32 ITEMS		
AVERAGE PER CENT CORRECT	79.8		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.23 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	27 ITEMS		
AVERAGE PER CENT CORRECT	74.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.19 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	70.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.29 S.D.
INFLECT TELETYPE RUSSIAN	33 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.83 S.D.
OTHER ITEM TYPES	19 ITEMS		
AVERAGE PER CENT CORRECT	77.0		
CORRECT LATENCY IN SECS.	3.0	AVG.	1.19 S.D.

LESSON 85 DATA FOR 15 STUDENTS

ALL ITEM TYPES	175 ITEMS		
AVERAGE PER CENT CORRECT	85.6		
CORRECT LATENCY IN SECS.	1.5	AVG.	1.08 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	45 ITEMS		
AVERAGE PER CENT CORRECT	82.1		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.27 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	90.0		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.14 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	74.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.39 S.D.
INFLECT TELETYPE RUSSIAN	108 ITEMS		
AVERAGE PER CENT CORRECT	87.4		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.11 S.D.
OTHER ITEM TYPES	11 ITEMS		
AVERAGE PER CENT CORRECT	90.3		
CORRECT LATENCY IN SECS.	2.2	AVG.	1.15 S.D.

LESSON 86 DATA FOR 22 STUDENTS

ALL ITEM TYPES	121	ITEMS		
AVERAGE PER CENT CORRECT	87.4			
CORRECT LATENCY IN SECS.	1.3	AVG.	1.15	S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	7	ITEMS		
AVERAGE PER CENT CORRECT	85.7			
CORRECT LATENCY IN SECS.	0.7	AVG.	0.14	S.D.
TRANSLATE FROM TELETYPE ENGLISH	24	ITEMS		
AVERAGE PER CENT CORRECT	82.2			
CORRECT LATENCY IN SECS.	0.5	AVG.	0.22	S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	22	ITEMS		
AVERAGE PER CENT CORRECT	93.6			
CORRECT LATENCY IN SECS.	0.6	AVG.	0.14	S.D.
TRANSFORM FROM TELETYPE RUSSIAN	12	ITEMS		
AVERAGE PER CENT CORRECT	81.1			
CORRECT LATENCY IN SECS.	0.6	AVG.	0.12	S.D.
TRANSFORM FROM SPOKEN RUSSIAN	1	ITEMS		
AVERAGE PER CENT CORRECT	90.9			
CORRECT LATENCY IN SECS.	0.7	AVG.	0.00	S.D.
INFLECT TELETYPE RUSSIAN	48	ITEMS		
AVERAGE PER CENT CORRECT	87.7			
CORRECT LATENCY IN SECS.	2.3	AVG.	1.24	S.D.
OTHER ITEM TYPES	7	ITEMS		
AVERAGE PER CENT CORRECT	95.5			
CORRECT LATENCY IN SECS.	1.9	AVG.	0.75	S.D.

LESSON 87 DATA FOR 25 STUDENTS

ALL ITEM TYPES	109 ITEMS		
AVERAGE PER CENT CORRECT	87.6		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.98 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	20 ITEMS		
AVERAGE PER CENT CORRECT	82.8		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.22 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	30 ITEMS		
AVERAGE PER CENT CORRECT	92.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.17 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	84.0		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.00 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	52 ITEMS		
AVERAGE PER CENT CORRECT	85.8		
CORRECT LATENCY IN SECS.	2.1	AVG.	0.96 S.D.
OTHER ITEM TYPES	5 ITEMS		
AVERAGE PER CENT CORRECT	96.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.61 S.D.

LESSON 88 DATA FOR 26 STUDENTS

ALL ITEM TYPES	231	ITEMS	
AVERAGE PER CENT CORRECT	72.7		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.05 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0	ITEMS	
TRANSLATE FROM TELETYPE ENGLISH	62	ITEMS	
AVERAGE PER CENT CORRECT	69.2		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.22 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0	ITEMS	
TRANSFORM FROM TELETYPE RUSSIAN	2	ITEMS	
AVERAGE PER CENT CORRECT	53.9		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.42 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0	ITEMS	
INFLECT TELETYPE RUSSIAN	136	ITEMS	
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.04 S.D.
OTHER ITEM TYPES	31	ITEMS	
AVERAGE PER CENT CORRECT	64.9		
CORRECT LATENCY IN SECS.	2.8	AVG.	0.86 S.D.

LESSON 89 DATA FOR 22 STUDENTS

ALL ITEM TYPES	230 ITEMS		
AVERAGE PER CENT CORRECT	80.1		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.94 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	84 ITEMS		
AVERAGE PER CENT CORRECT	79.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.28 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	2 ITEMS		
AVERAGE PER CENT CORRECT	56.9		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.28 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	135 ITEMS		
AVERAGE PER CENT CORRECT	81.5		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.94 S.D.
OTHER ITEM TYPES	9 ITEMS		
AVERAGE PER CENT CORRECT	69.2		
CORRECT LATENCY IN SECS.	2.4	AVG.	0.90 S.D.

LESSON 90 DATA FOR 24 STUDENTS

ALL ITEM TYPES	229 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.90 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	102 ITEMS		
AVERAGE PER CENT CORRECT	82.4		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	108 ITEMS		
AVERAGE PER CENT CORRECT	83.2		
CORRECT LATENCY IN SECS.	1.8	AVG.	0.92 S.D.
OTHER ITEM TYPES	19 ITEMS		
AVERAGE PER CENT CORRECT	73.0		
CORRECT LATENCY IN SECS.	2.5	AVG.	0.78 S.D.

LESSON 91 DATA FOR 18 STUDENTS

ALL ITEM TYPES	335 ITEMS		
AVERAGE PER CENT CORRECT	90.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.76 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	19 ITEMS		
AVERAGE PER CENT CORRECT	75.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.19 S.D
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	316 ITEMS		
AVERAGE PER CENT CORRECT	90.9		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.75 S.
OTHER ITEM TYPES	0 ITEMS		

Appendix 6

Third Quarter Lesson Summary Analysis

LESSONS 93 TO 135

ALL ITEM TYPES	2582 ITEMS		
AVERAGE PER CENT CORRECT	81.9		
CORRECT LATENCY IN SECS.	1.2 AVG.	1.07 S.D.	
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	740 ITEMS		
AVERAGE PER CENT CORRECT	77.4		
CORRECT LATENCY IN SECS.	0.7 AVG.	0.24 S.D.	
TRANSCRIBE FROM SPOKEN RUSSIAN	197 ITEMS		
AVERAGE PER CENT CORRECT	94.2		
CORRECT LATENCY IN SECS.	0.6 AVG.	0.22 S.D.	
TRANSFORM FROM TELETYPE RUSSIAN	314 ITEMS		
AVERAGE PER CENT CORRECT	78.5		
CORRECT LATENCY IN SECS.	0.9 AVG.	0.32 S.D.	
TRANSFORM FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	69.0		
CORRECT LATENCY IN SECS.	1.0 AVG.	0.26 S.D.	
INFLECT TELETYPE RUSSIAN	1097 ITEMS		
AVERAGE PER CENT CORRECT	82.8		
CORRECT LATENCY IN SECS.	1.5 AVG.	0.89 S.D.	
OTHER ITEM TYPES	218 ITEMS		
AVERAGE PER CENT CORRECT	87.2		
CORRECT LATENCY IN SECS.	2.2 AVG.	2.49 S.D.	

LESSON 93 DATA FOR 22 STUDENTS

ALL ITEM TYPES	126 ITEMS		
AVERAGE PER CENT CORRECT	91.0		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.97 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	26 ITEMS		
AVERAGE PER CENT CORRECT	86.9		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.17 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	95.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.35 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	83.1		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.22 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	69 ITEMS		
AVERAGE PER CENT CORRECT	92.0		
CORRECT LATENCY IN SECS.	1.8	AVG.	1.00 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	92.4		
CORRECT LATENCY IN SECS.	1.9	AVG.	1.01 S.D.

LESSON 100 DATA FOR 23 STUDENTS

ALL ITEM TYPES	135 ITEMS		
AVERAGE PER CENT CORRECT	83.6		
CORRECT LATENCY IN SECS.	1.5	AVG.	1.19 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	33 ITEMS		
AVERAGE PER CENT CORRECT	80.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.19 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	96.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.13 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	77.5		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.24 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	61 ITEMS		
AVERAGE PER CENT CORRECT	81.6		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.32 S.D.
OTHER ITEM TYPES	12 ITEMS		
AVERAGE PER CENT CORRECT	95.3		
CORRECT LATENCY IN SECS.	2.1	AVG.	1.07 S.D.

LESSON 102 DATA FOR 24 STUDENTS

ALL ITEM TYPES	129 ITEMS		
AVERAGE PER CENT CORRECT	85.5		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.95 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	23 ITEMS		
AVERAGE PER CENT CORRECT	76.3		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.36 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	16 ITEMS		
AVERAGE PER CENT CORRECT	93.2		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.29 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	78.0		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.32 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	69 ITEMS		
AVERAGE PER CENT CORRECT	86.0		
CORRECT LATENCY IN SECS.	1.8	AVG.	0.95 S.D.
OTHER ITEM TYPES	14 ITEMS		
AVERAGE PER CENT CORRECT	92.6		
CORRECT LATENCY IN SECS.	2.3	AVG.	0.73 S.D.

LESSON 104 DATA FOR 24 STUDENTS

ALL ITEM TYPES	144 ITEMS		
AVERAGE PER CENT CORRECT	84.5		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.88 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	49 ITEMS		
AVERAGE PER CENT CORRECT	85.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.24 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	97.6		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.34 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	77.6		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.19 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	68 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.87 S.D.
OTHER ITEM TYPES	12 ITEMS		
AVERAGE PER CENT CORRECT	90.3		
CORRECT LATENCY IN SECS.	2.5	AVG.	1.01 S.D.

LESSON 106 DATA FOR 23 STUDENTS

ALL ITEM TYPES	111 ITEMS		
AVERAGE PER CENT CORRECT	80.0		
CORRECT LATENCY IN SECS.	1.3	AVG.	1.04 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	35 ITEMS		
AVERAGE PER CENT CORRECT	74.8		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.30 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	96.0		
CORRECT LATENCY IN SECS.	0.5	AVG.	0.07 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	84.1		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.32 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	38 ITEMS		
AVERAGE PER CENT CORRECT	80.2		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.66 S.D.
OTHER ITEM TYPES	21 ITEMS		
AVERAGE PER CENT CORRECT	77.0		
CORRECT LATENCY IN SECS.	2.7	AVG.	1.33 S.D.

LESSON 108 DATA FOR 24 STUDENTS

ALL ITEM TYPES	151 ITEMS		
AVERAGE PER CENT CORRECT	84.7		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.96 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	35 ITEMS		
AVERAGE PER CENT CORRECT	80.0		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.29 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	23 ITEMS		
AVERAGE PER CENT CORRECT	94.9		
CORRECT LATENCY IN SECS.	0.5	AVG.	0.13 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	7 ITEMS		
AVERAGE PER CENT CORRECT	88.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.29 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	68 ITEMS		
AVERAGE PER CENT CORRECT	82.6		
CORRECT LATENCY IN SECS.	1.6	AVG.	0.85 S.D.
OTHER ITEM TYPES	18 ITEMS		
AVERAGE PER CENT CORRECT	87.3		
CORRECT LATENCY IN SECS.	2.2	AVG.	1.48 S.D.

LESSON 110 DATA FOR 24 STUDENTS

ALL ITEM TYPES	135 ITEMS		
AVERAGE PER CENT CORRECT	87.3		
CORRECT LATENCY IN SECS.	1.6	AVG.	1.00 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	31 ITEMS		
AVERAGE PER CENT CORRECT	78.1		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.37 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	91.7		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.34 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	5 ITEMS		
AVERAGE PER CENT CORRECT	94.2		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.43 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	66 ITEMS		
AVERAGE PER CENT CORRECT	88.7		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.97 S.D.
OTHER ITEM TYPES	21 ITEMS		
AVERAGE PER CENT CORRECT	92.5		
CORRECT LATENCY IN SECS.	2.3	AVG.	0.97 S.D.

LESSON 114 . DATA FOR 24 STUDENTS

ALL ITEM TYPES	131 ITEMS		
AVERAGE PER CENT CORRECT	81.4		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.95 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	52 ITEMS		
AVERAGE PER CENT CORRECT	74.2		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.27 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	10 ITEMS		
AVERAGE PER CENT CORRECT	96.2		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.12 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	90.3		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.32 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	5 ITEMS		
AVERAGE PER CENT CORRECT	65.8		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.23 S.D.
INFLECT TELETYPE RUSSIAN	53 ITEMS		
AVERAGE PER CENT CORRECT	85.6		
CORRECT LATENCY IN SECS.	2.0	AVG.	1.18 S.D.
OTHER ITEM TYPES	2 ITEMS		
AVERAGE PER CENT CORRECT	81.3		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.99 S.D.

LESSON 116 DATA FOR 23 STUDENTS

ALL ITEM TYPES	120 ITEMS		
AVERAGE PER CENT CORRECT	78.5		
CORRECT LATENCY IN SECS.	1.1	AVG.	2.09 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	39 ITEMS		
AVERAGE PER CENT CORRECT	74.5		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	87.8		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.20 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	18 ITEMS		
AVERAGE PER CENT CORRECT	79.2		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.33 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	11 ITEMS		
AVERAGE PER CENT CORRECT	70.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.27 S.D.
INFLECT TELETYPE RUSSIAN	31 ITEMS		
AVERAGE PER CENT CORRECT	81.8		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.66 S.D.
OTHER ITEM TYPES	4 ITEMS		
AVERAGE PER CENT CORRECT	71.9		
CORRECT LATENCY IN SECS.	7.6	AVG.	10.31 S.D.

LESSON 118 DATA FOR 24 STUDENTS

ALL ITEM TYPES	116 ITEMS		
AVERAGE PER CENT CORRECT	86.6		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.73 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	43 ITEMS		
AVERAGE PER CENT CORRECT	85.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.24 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	20 ITEMS		
AVERAGE PER CENT CORRECT	95.2		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.19 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	9 ITEMS		
AVERAGE PER CENT CORRECT	84.3		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.23 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	38 ITEMS		
AVERAGE PER CENT CORRECT	83.2		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.68 S.D.
OTHER ITEM TYPES	6 ITEMS		
AVERAGE PER CENT CORRECT	88.9		
CORRECT LATENCY IN SECS.	2.4	AVG.	1.97 S.D.

LESSON 120 DATA FOR 17 STUDENTS

ALL ITEM TYPES	136 ITEMS		
AVERAGE PER CENT CORRECT	86.8		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.77 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	51 ITEMS		
AVERAGE PER CENT CORRECT	78.2		
CORRECT LATENCY IN SECS.	0.5	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	17 ITEMS		
AVERAGE PER CENT CORRECT	93.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.18 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	57 ITEMS		
AVERAGE PER CENT CORRECT	90.6		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.87 S.D.
OTHER ITEM TYPES	11 ITEMS		
AVERAGE PER CENT CORRECT	96.3		
CORRECT LATENCY IN SECS.	1.7	AVG.	1.20 S.D.

LESSON 122 DATA FOR 24 STUDENTS

ALL ITEM TYPES	129 ITEMS		
AVERAGE PER CENT CORRECT	82.7		
CORRECT LATENCY IN SECS.	1.2	AVG.	1.04 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	42 ITEMS		
AVERAGE PER CENT CORRECT	79.7		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.18 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	14 ITEMS		
AVERAGE PER CENT CORRECT	94.0		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.13 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	0 ITEMS		
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	63 ITEMS		
AVERAGE PER CENT CORRECT	82.0		
CORRECT LATENCY IN SECS.	1.5	AVG.	0.91 S.D.
OTHER ITEM TYPES	10 ITEMS		
AVERAGE PER CENT CORRECT	83.3		
CORRECT LATENCY IN SECS.	2.9	AVG.	1.88 S.D.

LESSON 124 DATA FOR 20 STUDENTS

ALL ITEM TYPES	129 ITEMS		
AVERAGE PER CENT CORRECT	78.2		
CORRECT LATENCY IN SECS.	1.2	AVG.	1.79 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	30 ITEMS		
AVERAGE PER CENT CORRECT	72.8		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.26 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	12 ITEMS		
AVERAGE PER CENT CORRECT	95.4		
CORRECT LATENCY IN SECS.	0.5	AVG.	0.07 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	13 ITEMS		
AVERAGE PER CENT CORRECT	64.2		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.34 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	65 ITEMS		
AVERAGE PER CENT CORRECT	81.1		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.64 S.D.
OTHER ITEM TYPES	9 ITEMS		
AVERAGE PER CENT CORRECT	72.7		
CORRECT LATENCY IN SECS.	3.8	AVG.	6.14 S.D.

LESSON 126 DATA FOR 23 STUDENTS

ALL ITEM TYPES	130 ITEMS		
AVERAGE PER CENT CORRECT	79.0		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.67 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	24 ITEMS		
AVERAGE PER CENT CORRECT	69.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.17 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	4 ITEMS		
AVERAGE PER CENT CORRECT	92.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.22 S.D.
TRANSFORM FROM TELETYPE RUSSIAN	4 ITEMS		
AVERAGE PER CENT CORRECT	90.3		
CORRECT LATENCY IN SECS.	0.8	AVG.	0.31 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	82 ITEMS		
AVERAGE PER CENT CORRECT	79.4		
CORRECT LATENCY IN SECS.	1.4	AVG.	0.57 S.D.
OTHER ITEM TYPES	16 ITEMS		
AVERAGE PER CENT CORRECT	85.3		
CORRECT LATENCY IN SECS.	1.9	AVG.	0.76 S.D.

LESSON 128 DATA FOR 22 STUDENTS

ALL ITEM TYPES	163 ITEMS		
AVERAGE PER CENT CORRECT	72.1		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.61 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	93 ITEMS		
AVERAGE PER CENT CORRECT	67.4		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.19 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	3 ITEMS		
AVERAGE PER CENT CORRECT	100.0		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.06 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	51 ITEMS		
AVERAGE PER CENT CORRECT	72.6		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.79 S.D.
OTHER ITEM TYPES	16 ITEMS		
AVERAGE PER CENT CORRECT	91.8		
CORRECT LATENCY IN SECS.	1.3	AVG.	0.67 S.D.

LESSON 130 DATA FOR 22 STUDENTS

ALL ITEM TYPES	333 ITEMS		
AVERAGE PER CENT CORRECT	79.1		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.40 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	0 ITEMS		
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	197 ITEMS		
AVERAGE PER CENT CORRECT	77.3		
CORRECT LATENCY IN SECS.	0.9	AVG.	0.32 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	97 ITEMS		
AVERAGE PER CENT CORRECT	79.3		
CORRECT LATENCY IN SECS.	1.2	AVG.	0.48 S.D.
OTHER ITEM TYPES	39 ITEMS		
AVERAGE PER CENT CORRECT	88.1		
CORRECT LATENCY IN SECS.	1.0	AVG.	0.36 S.D.

LESSON 132 DATA FOR 19 STUDENTS

ALL ITEM TYPES	264 ITEMS		
AVERAGE PER CENT CORRECT	79.4		
CORRECT LATENCY IN SECS.	0.9	AVG.	1.21 S.D.
TYPE ANSWERS TO SPOKEN RUSSIAN	0 ITEMS		
TRANSLATE FROM TELETYPE ENGLISH	134 ITEMS		
AVERAGE PER CENT CORRECT	79.5		
CORRECT LATENCY IN SECS.	0.6	AVG.	0.20 S.D.
TRANSCRIBE FROM SPOKEN RUSSIAN	0 ITEMS		
TRANSFORM FROM TELETYPE RUSSIAN	8 ITEMS		
AVERAGE PER CENT CORRECT	73.7		
CORRECT LATENCY IN SECS.	0.7	AVG.	0.22 S.D.
TRANSFORM FROM SPOKEN RUSSIAN	0 ITEMS		
INFLECT TELETYPE RUSSIAN	121 ITEMS		
AVERAGE PER CENT CORRECT	80.3		
CORRECT LATENCY IN SECS.	1.1	AVG.	0.57 S.D.
OTHER ITEM TYPES	1 ITEMS		
AVERAGE PER CENT CORRECT	2.0		
CORRECT LATENCY IN SECS.	19.0	AVG.	0.00 S.D.

Appendix 7

Results of First-year Russian Examinations

TABLE 1

Results of First-year Russian Autumn Quarter Midterm Examination

(Common Portion)

Number of Errors	Computer-based	Regular
1.5	1	
2.5		3
4	2	
4.5		2
5	1	
5.5		3
6	1	
6.5	2	
7.5		3
8	2	
8.5	1	1
9	1	
10	1	4
10.5		2
11	1	
11.5		1
12	1	
12.5	1	
13		1
13.5	1	1
14	1	
15	1	
17	1	
18.5		1
19		1
20	1	
20.5	1	
21	1	
23.5		1
24	1	
24.5	2	
25		1
26.5	1	
30.5	1	
31	1	
32		1
34.5	1	
38		1
39.5		1
41		1
42.5		1
Total number of students	29	30
Total number of errors	429	442

TABLE 2

Results of First-year Russian Autumn Quarter Final Examination

(Common Portion)

Number of Errors	Computer-based	Regular
3.5	1	
5	2	1
6	3	
7	1	
8	2	
9	3	
11	3	
13		1
15	1	
16	1	1
17	2	
19		1
21	2	1
22	1	1
23		2
25	1	1
27	3	
29		1
30		1
31		2
33	1	
34		1
37	1	
38	1	
41		1
43		1
45		1
53		1
61		1
64		1
65		1
72		1
76		1
79		1
93		1
97		1
120		1
141		1
Total number of students	29	28
Total number of errors	457.5	1372.0
Total possible errors per student	350	

TABLE 3

Results of First-year Winter Quarter Midterm Examination

(Common Portion)

Number of Errors	Computer-based (Old)	Computer-based (New)	Computer-based (Total)	Regular
4	1		1	
4.5	1		1	
5	1		1	
5.5				1
6	2	1	3	1
7				1
7.5	1		1	
8	3		3	
8.5	2		2	1
9	1		1	
9.5	2		2	2
10				1
11				2
12.5				1
13	1		1	
13.5	1	1	2	
14	1		1	
14.5				1
15	1		1	
15.5				1
16.5	1		1	1
17	1		1	1
18	2		2	
18.5	2		2	
20	1		1	
32	1		1	
36				1
Total number of students	26	2	28	15
Total number of errors	316	19.5	335.5	190
Average number of errors	12.10	9.75	12.0	12.7

TABLE 4

Results of First-year Winter Quarter Final Examination

(Common Portion)

Number of Errors	Computer-based (Old)	Computer-based (New)	Computer-based (Total)	Regular
2	1		1	
6	1		1	
6.5	1		1	
8	1		1	
9.5				1
10	1		1	
11				1
12	2		2	
13				1
14.5				1
16	1		1	
16.5	1		1	
18	1		1	
18.5	1		1	
19	1		1	
19.5				1
21	2		2	
22.5	1		1	1
23		1	1	1
23.5	1		1	
24	1		1	
24.5				1
25	1		1	
26.5				1
27	1		1	
29.5	1		1	
30				1
30.5				1
32.5				1
33	1		1	
37.5	2		2	
38		1	1	
39.5	1		1	
41	1		1	2
47.5				1
Total number of students	25	2	27	15
Total number of errors	526.5	61	587.5	386.5
Average number of errors	21.06	30.5	21.8	25.8

TABLE 5

Results of First-year Spring Quarter Midterm Examination

(Common Portion)

Number of Errors	Computer-based (Old)	Computer-based (New)	Computer-based (Total)	Regular
4.5				1
5.5	1		1	
6	1		1	1
6.5		1	1	
7.5	1		1	
8	1		1	1
8.5	1		1	
9	1		1	
10				1
11				1
12.5	1		1	
13	1		1	1
13.5	2		2	1
14	2		2	
14.5	1		1	
15	1		1	1
16				3
17	3		3	1
17.5				1
18.5				1
19		1	1	
20.5	1		1	
21.5	1		1	
22.5	1		1	
23	1		1	
35				1
43	1		1	
43.5				1
Total number of students	22	2	24	16
Total number of errors	336	25.5	361.5	260.5
Average number of errors	15.27	12.75	15.1	16.3

TABLE 6

Results of First-year Russian Spring Quarter Final Examination

(Common Portion)

Number of Errors	Computer-based (Old)	Computer-based (New)	Computer-based (Total)	Regular (Old)	Regular (New)	Regular (Total)	Transfer
21.5	1		1				
24.5	1		1				
26	1		1				
27	1		1				
31.5	1		1				
32	1		1				
34				1		1	
35	1		1	1		1	
37	1		1	1		1	
39				1		1	
40	1		1				
41				1		1	
42	1		1				
45	1		1				
46				1		1	
47.5		1	1				
50.5					1	1	
51.5	1		1				
60	1		1	1		1	
61	1		1				
63.5				1		1	
67					1	1	
69	1		1				
69.5	1		1				
73	1		1				
74.5	2		2		1	1	
76.5	1		1				
80.5				1		1	
81	1		1				
82		1	1				
89				1		1	
91				1		1	
92				1		1	
93	1		1				
106				1		1	
166							1
Total number of students	22	2	24	12	3	15	1
Total number of errors	1145	129.5	1274.5	779	192	971	166
Average number of errors	52.04	64.75	53.1	64.91	64	64.7	166

Appendix 8

Examples of Daily Summary Sheets

DAILY RUSSIAN REPORT AS OF 10 APR. 1968 21:12

PREVIOUS LESSON NO.	PCT.	TIME		NEXT LESSON	STUDENT NUMBER AND NAME
95	73	53	--	96	02 LIZ BABCOCK
97	86	51		98	03 JANIE BONHAM
97	91	44		98	04 DOUGLAS BROTZ
97	85	46		98	05 LES BUSH
94	86	43	--	95	06 ANNE CHIAPELLA
97	72	46		98	07 KERI CHRISTENFELD
97	82	48		98	08 THOMAS CHUN
97	82	49		98	09 GEORGE ESTES
96	84	61	--	97	10 RICHARD GABLE
96	96	42	--	97	11 PETER GOLDSMITH
97	85	51		98	12 TIMOTHY GROVES
97	88	43		98	14 RONALD HARRIS
97	83	52		98	15 GREG HIBDON
93	93	35	--	94	16 DOUGLAS LEMPEREUR
96	80	53	--	97	17 PAUL MARIENTHAL
97	56	62	XX	97	18 TERRY MCFARLAND
97	80	60		98	19 FRED OAKFORD
97	85	49		98	20 ERIC OLSEN
97	91	52		98	21 RUSTY RUSSELL
95	82	56	--	96	22 JAY SPEAS
97	85	48		98	23 MELYN SPERRY
97	80	47		98	27 BECKY WILMOTH
97	82	49		98	28 SHARON WOOD
97	83	51		98	29 TOM KNAPP

DAILY RUSSIAN REPORT AS OF 22 MAY 1968 20:53

PREVIOUS LESSON NO.	PCT.	TIME		NEXT LESSON	STUDENT NUMBER AND NAME	
122	79	49	--	123	02	LIZ BABCOCK
RESTART-PR.71-AUD.33				119	03	JANIE BONHAM
123	87	47		124	04	DOUGLAS BROTZ
123	81	49		124	05	LES BUSH
123	74	57		124	06	ANNE CHIAPELLA
123	83	47		124	07	KERI CHRISTENFELD
122	74	52	--	123	08	THOMAS CHUN
123	81	53		124	09	GEORGE ESTES
122	80	59	--	123	10	RICHARD GABLE
122	83	48	--	123	11	PETER GOLDSMITH
123	92	54		124	12	TIMOTHY GROVES
121	86	51	--	122	14	RONALD HARRIS
123	80	53		124	15	GREG HIBDON
123	85	54		124	16	DOUGLAS LEMPEREUR
121	86	55	--	122	17	PAUL MARIENTHAL
122	71	57	--	123	18	TERRY MCFARLAND
122	68	66	XX	122	19	FRED OAKFORD
123	79	53		124	20	ERIC OLSEN
123	88	47		124	21	RUSTY RUSSELL
121	81	56	--	122	22	JAY SPEAS
123	82	54		124	23	MELYN SPERRY
123	80	54		124	27	BECKY WILMOTH
123	88	54		124	28	SHARON WOOD
121	84	56	--	122	29	TOM KNAPP

DAILY RUSSIAN REPORT AS OF 7 JUNE 1968 02:49

PREVIOUS LESSON NO.	PCT.	TIME		NEXT LESSON		STUDENT NUMBER AND NAME
133	A:>	23	XX	133	02	LIZ BABCOCK
132	67	57	XX	132	03	JANIE BONHAM
135	82	32		136	04	DOUGLAS BROTZ
134	94	16	--	135	05	LES BUSH
133	66	100	XX	133	06	ANNE CHIAPELLA
133	81	56	--	134	07	KERI CHRISTENFELD
135	77	38		136	08	THOMAS CHUN
133	54	78	XX	133	09	GEORGE ESTES
133	58	96	XX	133	10	RICHARD GABLE
135	81	29		136 R	11	PETER GOLDSMITH
133	48	91	XX	133	12	TIMOTHY GROVES
133	86	52	--	134	14	RONALD HARRIS
133	74	82	--	134	15	GREG HIBDON
133	57	77	XX	133	16	DOUGLAS LEMPEREUR
133	49	79	XX	133	17	PAUL MARIENTHAL
133	37	65	XX	134	18	TERRY MCFARLAND
133	60	89	XX	133	19	FRED OAKFORD
133	65	78	XX	133	20	ERIC OLSEN
133	82	70	--	134	21	RUSTY RUSSELL
RESTART-PR.56-NO AUD				132	22	JAY SPEAS
133	85	60	--	134	23	MELYN SPERRY
133	73	70	--	134	27	BECKY WILMOTH
135	78	35		136	28	SHARON WOOD
133	45	81	XX	133	29	TOM KNAPP

Appendix 9

Samples of Summaries from Data Report

LESSON 10
NUMBER OF PROBLEMS 252
NUMBER OF STUDENTS WHO COMPLETED THIS LESSON 19

PROB	AVCL	AVWL	TCR	PRCNT	TWRG	PRCNT	TR2	PRCNT	TR3	PRCNT	TTO	PRCNT
1.1	0.9	1.9	12	63.2	7	36.8	6	85.7	1	14.3		
2.1	0.5		19	100.0								
3.1	0.7	0.9	18	94.7	1	5.3	1	100.0				
4.1	0.8		18	94.7	1	5.3	1	100.0				
5.1	0.4	1.4	17	89.5	2	10.5	2	100.0				
6.1	0.4		19	100.0								
7.1	0.4		19	100.0								
8.1	0.8		19	100.0								
9.1	2.3	3.2	18	94.7	1	5.3	1	100.0				
10.1	0.7		19	100.0								
11.1	0.6		19	100.0								
12.1	3.3		19	100.0								
13.1	2.3	4.1	18	94.7	1	5.3	1	100.0				
14.1	1.2		19	100.0								
15.1	4.0		19	100.0								
16.1	1.5		18	94.7			1	100.0			1	5.3
17.1	1.5	1.1	11	57.9	7	36.8	4	50.0	4	50.0	1	5.3
18.1	0.9	3.4	18	94.7	1	5.3	1	100.0				
19.1	0.5	1.7	18	94.7	1	5.3	1	100.0				
20.1	0.6		19	100.0								
21.1	0.9	3.4	15	78.9	4	21.1	1	25.0	3	75.0		
22.1	0.6	0.1	18	94.7	1	5.3	1	100.0				
23.1	1.5	1.1	18	94.7	1	5.3			1	100.0		
24.1	0.3		19	100.0								
25.1	1.2	1.6	17	89.5	1	5.3	1	50.0	1	50.0	1	5.3
26.1	3.5	4.4	11	57.9	8	42.1	4	50.0	4	50.0		
27.1	2.4		19	100.0								
28.1	1.7		19	100.0								
29.1	0.5	0.7	17	89.5	2	10.5	2	100.0				
30.1	0.6	1.3	18	94.7	1	5.3	1	100.0				
31.1	0.6	0.8	18	94.7	1	5.3	1	100.0				
32.1	0.4	0.5	18	94.7	1	5.3	1	100.0				
33.1	1.2	2.2	11	57.9	7	36.8	4	50.0	4	50.0	1	5.3
34.1	0.9	0.7	15	78.9	4	21.1	4	100.0				
35.1	0.7		19	100.0								
36.1	0.6	2.7	18	94.7	1	5.3			1	100.0		
37.1	1.9	1.3	18	94.7	1	5.3	1	100.0				
38.1	2.3	10.2	11	57.9	8	42.1	7	87.5	1	12.5		
39.1	1.3		19	100.0								
40.1	0.9		19	100.0								
41.1	2.1		19	100.0								
42.1	1.0		19	100.0								
43.1	1.5		19	100.0								
44.1	1.7		19	100.0								
44.2	1.6		19	100.0								
45.1	1.8	4.9	16	84.2	3	15.8	2	66.7	1	33.3		
46.1	3.0		19	100.0								

47.1	0.7	1.3	16	84.2	2	10.5	3	100.0			1	5.3
48.1	0.6	0.0	18	94.7	1	5.3	1	100.0				
49.1	0.6	61.4	17	89.5	2	10.5	2	100.0				
50.1	0.8	0.7	16	84.2	3	15.8	3	100.0				
51.1	3.8	3.9	8	42.1	11	57.9	3	27.3	8	72.7		
52.1	2.4	3.3	16	84.2	3	15.8	3	100.0				
53.1	2.3	7.3	16	84.2	2	10.5	3	100.0			1	5.3
54.1	8.7		19	100.0								
55.1	1.3		18	94.7	1	5.3	1	100.0				
56.1	1.4		19	100.0								
57.1	1.3		19	100.0								
58.1	0.8	3.1	11	57.9	8	42.1	4	50.0	4	50.0		
59.1	0.7		19	100.0								
60.1	0.7	1.3	18	94.7	1	5.3	1	100.0				
61.1	3.0		19	100.0								
61.2	1.9		19	100.0								
62.1	1.6		18	94.7			1	100.0			1	5.3
63.1	2.0		19	100.0								
64.1	1.4	1.1	14	73.7	5	26.3	2	40.0	3	60.0		
65.1	0.6	1.0	17	89.5	2	10.5	2	100.0				
66.1	1.0	0.7	13	68.4	6	31.6	5	83.3	1	16.7		
67.1	0.8	1.1	17	89.5	2	10.5	2	100.0				
68.1	1.4		19	100.0								
69.1	0.6		19	100.0								
70.1	2.0	2.0	17	89.5	2	10.5	1	50.0	1	50.0		
71.1	4.0	3.4	15	78.9	4	21.1	4	100.0				
72.1	0.6	1.3	18	94.7	1	5.3	1	100.0				
73.1	1.7	0.7	12	63.2	7	36.8	6	85.7	1	14.3		
74.1	0.5	1.8	18	94.7	1	5.3	1	100.0				
75.1	0.9	1.8	16	84.2	2	10.5	2	66.7	1	33.3	1	5.3
76.1	1.1	1.2	18	94.7	1	5.3	1	100.0				
77.1	0.8		19	100.0								
78.1	1.2	1.0	11	57.9	8	42.1	5	62.5	2	25.0		
79.1	5.4	3.7	2	10.5	17	89.5	3	17.6	12	70.6		
80.1	0.8		19	100.0								
81.1	3.9	13.4	8	42.1	11	57.9	3	27.3	8	72.7		
82.1	2.3	3.7	16	84.2	2	10.5	1	33.3	2	66.7	1	5.3
83.1	1.4	0.9	10	52.6	7	36.8	5	55.6	4	44.4	2	10.5
84.1	2.3	3.7	15	78.9	4	21.1	2	50.0	2	50.0		
85.1	1.1	2.7	18	94.7	1	5.3	1	100.0				
86.1	2.3	5.1	7	36.8	8	42.1	5	41.7	7	58.3	4	21.1
87.1	5.3	6.4	15	78.9	3	15.8	3	75.0	1	25.0	1	5.3
88.1	1.9	0.0	18	94.7	1	5.3	1	100.0				
89.1	0.7	0.7	18	94.7	1	5.3	1	100.0				
90.1	1.0	1.8	7	36.8	10	52.6	10	83.3	2	16.7	2	10.5
91.1	3.7		18	94.7			1	100.0			1	5.3
92.1	2.1		19	100.0								
93.1	2.4	6.3	14	73.7	5	26.3	4	80.0	1	20.0		
94.1	2.9		19	100.0								
95.1	2.2	42.4	15	78.9	3	15.8	3	75.0	1	25.0	1	5.3
96.1	2.1		18	94.7			1	100.0			1	5.3
97.1	3.1	2.4	13	68.4	5	26.3	2	33.3	4	66.7	1	5.3
98.1	1.2	1.5	11	57.9	8	42.1	3	37.5	5	62.5		
99.1	0.9	2.2	10	52.6	9	47.4	4	44.4	5	55.6		
100.1	0.5		18	94.7							1	5.3

101.1	1.0	2.5	12	63.2	7	36.8	4	57.1	2	28.6		
102.1	0.7	1.9	12	63.2	6	31.6	2	28.6	5	71.4	1	5.3
103.1	1.5	13.6	10	52.6	7	36.8	3	33.3	6	66.7	2	10.5
104.1	0.7		19	100.0								
105.1	3.4	0.1	17	89.5	1	5.3	2	100.0			1	5.3
106.1	1.2	1.2	17	89.5	1	5.3	2	100.0			1	5.3
107.1	0.9		19	100.0								
108.1	1.2		18	94.7	1	5.3	1	100.0				
109.1	1.7	1.2	9	47.4	10	52.6	6	60.0	4	40.0		
110.1	1.1	1.5	18	94.7	1	5.3	1	100.0				
111.1	0.7		19	100.0								
112.1	1.1		19	100.0								
113.1	0.8		19	100.0								
114.1	0.7	0.1	18	94.7	1	5.3	1	100.0				
115.1	1.0	1.8	10	52.6	9	47.4	6	66.7	3	33.3		
116.1	1.6	4.3	8	42.1	10	52.6	5	45.5	6	54.5	1	5.3
117.1	1.3		19	100.0								
118.1	0.8	1.0	18	94.7	1	5.3	1	100.0				
119.1	1.0	0.9	18	94.7	1	5.3	1	100.0				
120.1	0.7	2.0	6	31.6	12	63.2	9	69.2	3	23.1	1	5.3
121.1	1.8	4.1	4	21.1	15	78.9	5	33.3	10	66.7		
122.1	1.0		19	100.0								
123.1	1.0		19	100.0								
124.1	1.6	0.1	18	94.7	1	5.3	1	100.0				
125.1	3.3	0.1	18	94.7	1	5.3	1	100.0				
126.1	0.9	3.2	7	36.8	12	63.2	7	58.3	5	41.7		
127.1	3.0	2.8	8	42.1	9	47.4	5	45.5	6	54.5	2	10.5
128.1	0.8	0.7	17	89.5	2	10.5	2	100.0				
129.1	1.2	1.3	4	21.1	15	78.9	9	60.0	5	33.3		
130.1	0.3	0.8	18	94.7	1	5.3	1	100.0				
131.1	1.6	1.1	8	42.1	7	36.8	6	54.5	4	36.4	4	21.1
132.1	0.8	1.8	18	94.7	1	5.3	1	100.0				
133.1	1.6	2.5	15	78.9	4	21.1	2	50.0	2	50.0		
134.1	0.7	1.3	17	89.5	2	10.5	1	50.0	1	50.0		
135.1	1.5	5.1	9	47.4	8	42.1	5	50.0	5	50.0	2	10.5
136.1	1.5	3.4	10	52.6	8	42.1	6	66.7	3	33.3	1	5.3
137.1	2.2	3.6	12	63.2	6	31.6	4	57.1	3	42.9	1	5.3
138.1	1.0		19	100.0								
139.1	2.1		19	100.0								
140.1	1.1		19	100.0								
141.1	1.4	4.0	15	78.9	4	21.1	2	50.0	2	50.0		
142.1	0.9	0.9	18	94.7	1	5.3	1	100.0				
143.1	0.9		18	94.7	1	5.3			1	100.0		
144.1	0.4		19	100.0								
145.1	1.6	0.7	18	94.7	1	5.3	1	100.0				
146.1	0.8		18	94.7	1	5.3	1	100.0				
147.1	1.0	2.4	12	63.2	7	36.8	5	71.4	1	14.3		
148.1	3.8	1.0	16	84.2	3	15.8	1	33.3	2	66.7		
149.1	2.9	6.0	17	89.5	1	5.3	2	100.0			1	5.3
150.1	0.7	31.1	17	89.5	2	10.5	2	100.0				
151.1	1.2	4.8	12	63.2	5	26.3	4	57.1	3	42.9	2	10.5
152.1	1.2	1.6	7	36.8	12	63.2	10	83.3	2	16.7		
153.1	1.7		19	100.0								
154.1	0.7		19	100.0								
155.1	1.1	1.4	17	89.5	2	10.5	2	100.0				

156.1	1.3	1.6	10	52.6	9	47.4	3	33.3	6	66.7		
157.1	1.7	11.2	13	68.4	6	31.6	4	66.7	2	33.3		
158.1	0.6	1.5	10	52.6	9	47.4	6	66.7	3	33.3		
159.1	1.3	3.4	15	78.9	4	21.1	2	50.0	2	50.0		
160.1	0.8	1.3	13	68.4	4	21.1	4	66.7	2	33.3	2	10.5
161.1	0.8	1.1	12	63.2	6	31.6	7	100.0			1	5.3
162.1	1.3	2.0	12	63.2	6	31.6	4	57.1	3	42.9	1	5.3
163.1	1.3	4.9	10	52.6	8	42.1	7	77.8	2	22.2	1	5.3
164.1	0.8	2.3	13	68.4	5	26.3	4	66.7	1	16.7	1	5.3
165.1	1.4	3.0	11	57.9	8	42.1	6	75.0	2	25.0		
166.1	0.7		19	100.0								
167.1	1.1	2.3	14	73.7	5	26.3	4	80.0	1	20.0		
168.1	0.9		19	100.0								
169.1	2.9	4.0	10	52.6	9	47.4	2	22.2	7	77.8		
170.1	0.8		19	100.0								
171.1	1.1	0.8	16	84.2	3	15.8	3	100.0				
172.1	1.2		19	100.0								
173.1	0.8		18	94.7	1	5.3	1	100.0				
174.1	0.7		19	100.0								
175.1	0.7	1.0	18	94.7	1	5.3	1	100.0				
176.1	3.6	7.6	16	84.2	3	15.8	2	66.7	1	33.3		
177.1	1.0		18	94.7	1	5.3	1	100.0				
178.1	1.3	5.3	17	89.5	2	10.5	2	100.0				
179.1	1.2	1.1	14	73.7	4	21.1	4	80.0	1	20.0	1	5.3
180.1	0.8	1.1	12	63.2	7	36.8	7	100.0				
181.1	0.8		19	100.0								
182.1	2.4	1.5	16	84.2	3	15.8	3	100.0				
183.1	0.7		19	100.0								
184.1	3.6	13.0	12	63.2	6	31.6	4	57.1	3	42.9	1	5.3
185.1	1.7		19	100.0								
186.1	1.7	5.9	18	94.7	1	5.3	1	100.0				
187.1	1.0		19	100.0								
188.1	1.9	1.9	5	26.3	11	57.9	8	57.1	6	42.9	3	15.8
189.1	1.4	2.1	8	42.1	11	57.9	8	72.7	3	27.3		
190.1	1.9	1.3	14	73.7	5	26.3	5	100.0				
191.1	0.7		19	100.0								
192.1	0.7	0.9	16	84.2	3	15.8	2	66.7	1	33.3		
193.1	2.0	1.5	18	94.7	1	5.3	1	100.0				
194.1	1.0	2.6	14	73.7	4	21.1	3	60.0	1	20.0	1	5.3
195.1	0.6	2.0	14	73.7	5	26.3	5	100.0				
196.1	0.6	3.2	13	68.4	6	31.6	2	33.3	4	66.7		
197.1	0.7		19	100.0								
198.1	1.3	1.0	17	89.5	2	10.5	1	50.0	1	50.0		
199.1	0.8	1.9	11	57.9	6	31.6	3	37.5	5	62.5	2	10.5
200.1	1.8	2.8	11	57.9	7	36.8	5	62.5	3	37.5	1	5.3
201.1	1.0	3.3	4	21.1	15	78.9	10	66.7	5	33.3		
202.1	0.7	2.1	12	63.2	7	36.8	3	42.9	4	57.1		
203.1	3.1	4.1	16	84.2	3	15.8	2	66.7	1	33.3		
204.1	1.2		19	100.0								
205.1	2.4	1.5	7	36.8	10	52.6	8	66.7	4	33.3	2	10.5
206.1	0.9	1.3	12	63.2	7	36.8	6	85.7	1	14.3		
207.1	1.2	1.4	12	63.2	5	26.3	6	85.7	1	14.3	2	10.5
208.1	1.1	1.4	12	63.2	7	36.8	6	85.7	1	14.3		
209.1	1.8		19	100.0								
210.1	0.8		19	100.0								

211.1	0.7		19	100.0								
212.1	1.1	0.8	16	84.2	3	15.8	3	100.0				
213.1	1.1	1.6	12	63.2	7	36.8	7	100.0				
214.1	1.1	0.8	18	94.7	1	5.3	1	100.0				
215.1	1.0	1.0	18	94.7	1	5.3	1	100.0				
216.1	1.1	1.5	12	63.2	7	36.8	6	85.7				
217.1	2.6		19	100.0								
218.1	1.5		19	100.0								
219.1	1.9	3.3	6	31.6	13	68.4	4	30.8	8	61.5		
220.1	1.1	5.2	18	94.7	1	5.3	1	100.0				
221.1	1.1	1.1	8	42.1	10	52.6	10	90.9	1	9.1	1	5.3
222.1	1.5	1.5	18	94.7	1	5.3	1	100.0				
223.1	0.7	1.5	16	84.2	3	15.8	3	100.0				
224.1	0.5	1.3	4	21.1	15	78.9	6	40.0	9	60.0		
225.1	1.7	3.5	18	94.7	1	5.3	1	100.0				
226.1	1.0	1.8	18	94.7	1	5.3	1	100.0				
227.1	0.9		19	100.0								
228.1	1.4		19	100.0								
229.1	1.7		19	100.0								
230.1	0.9	2.4	16	84.2	2	10.5	3	100.0			1	5.3
231.1	0.5	20.0	18	94.7	1	5.3	1	100.0				
232.1	0.8	4.0	16	84.2	3	15.8	2	66.7	1	33.3		
233.1	0.7		19	100.0								
234.1	0.8	1.0	13	68.4	6	31.6	2	33.3	4	66.7		
235.1	0.8	0.7	16	84.2	3	15.8	3	100.0				
236.1	1.0	1.1	17	89.5	1	5.3	1	50.0	1	50.0	1	5.3
237.1	0.7		19	100.0								
238.1	0.7		19	100.0								
239.1	1.4	0.7	11	57.9	6	31.6	6	75.0	2	25.0	2	10.5
240.1	0.8	0.9	8	42.1	11	57.9	7	63.6	4	36.4		
241.1	1.0	0.1	17	89.5	1	5.3	2	100.0			1	5.3
242.1	1.2		19	100.0								
243.1	0.9	2.1	16	84.2	3	15.8	2	66.7	1	33.3		
244.1	0.8		19	100.0								
245.1	1.1	1.0	18	94.7	1	5.3	1	100.0				
246.1	0.8		19	100.0								
247.1	0.5	1.8	3	15.8	13	68.4	8	50.0	8	50.0	3	15.8
248.1	0.8	0.6	10	52.6	9	47.4	7	77.3	2	22.2		
249.1	0.7	0.8	16	84.2	2	10.5	3	100.0			1	5.3
250.1	1.0	1.5	16	84.2	2	10.5	2	66.7	1	33.3	1	5.3
251.1	1.0	0.7	3	15.8	16	84.2	7	43.8	9	56.3		
252.1		0.9			19	100.0	7	36.8	11	57.9		

END OF DATA ANALYSIS FOR LESSON 10

LESSON 62
NUMBER OF PROBLEMS 121
NUMBER OF STUDENTS WHO COMPLETED THIS LESSON 28

PROB FOLLOWING	AVCL	AVWL	TCR	PRCNT	TWRG	PRCNT	TR2	PRCNT	TR3	PRCNT	TTO	PRCNT
PROBLEM WAS CHANGED												
1.1	1.1		18	64.3							2	7.1
2.1	0.8	2.2	24	85.7	3	10.7	4	133.3				
3.1	0.5	0.4	24	85.7	4	14.3	4	100.0				
4.1	0.7	0.9	17	60.7	11	39.3	11	100.0				
5.1	0.6	0.3	26	92.9	2	7.1	2	100.0				
6.1	0.8	1.9	24	85.7	4	14.3	4	100.0				
7.1	0.7	0.3	24	85.7	4	14.3	4	100.0				
8.1	0.6	1.0	25	89.3	3	10.7	3	100.0				
9.1	0.7	2.4	11	39.3	17	60.7	15	88.2				
10.1	1.3	7.0	23	82.1	5	17.9	5	100.0				
11.1	2.8	7.5	19	67.9	5	17.9	3	33.3			4	14.3
11.2	1.8	4.1	23	82.1	5	17.9	4	80.0				
11.3	1.3	4.9	27	96.4	1	3.6	1	100.0				
12.1	1.9	4.5	25	89.3	2	7.1	3	100.0			1	3.6
12.2	1.5	0.4	27	96.4	1	3.6						
13.1	4.0		28	100.0								
13.2	2.3	3.7	25	89.3	2	7.1	3	100.0			1	3.6
13.3	1.1	4.5	27	96.4	1	3.6	1	100.0				
14.1	2.0	6.1	20	71.4	6	21.4	6	75.0			2	7.1
14.2	1.5		28	100.0								
14.3	1.3		28	100.0								
15.1	1.6		28	100.0								
16.1	0.7	1.4	26	92.9	2	7.1	2	100.0				
17.1	0.7	1.1	27	96.4	1	3.6	1	100.0				
18.1	0.9	0.9	26	92.9	1	3.6	2	100.0			1	3.6
19.1	0.8	0.9	25	89.3	3	10.7	3	100.0				
20.1	1.0	1.9	20	71.4	8	28.6						
21.1	0.9	1.1	22	78.6	5	17.9					1	3.6
22.1	1.0	0.6	26	92.9	2	7.1						
23.1	0.7	0.7	27	96.4	1	3.6						
24.1	1.2	1.9	17	60.7	11	39.3						
25.1	0.8	0.8	21	75.0	7	25.0						
26.1	1.0	1.7	24	85.7	4	14.3						
27.1	0.7	0.7	26	92.9	2	7.1						
28.1	1.5		28	100.0								
29.1	3.8	5.9	20	71.4	6	21.4					2	7.1
30.1	1.9		28	100.0								
31.1	2.8	8.2	24	85.7	3	10.7					1	3.6
32.1	2.8	5.6	23	82.1	2	7.1					3	10.7
33.1	2.1		27	96.4							1	3.6
34.1	1.6		28	100.0								
35.1	1.1		28	100.0								
36.1	1.4		28	100.0								
37.1	1.0	1.0	27	96.4	1	3.6						
38.1	0.7		28	100.0								
39.1	0.7	2.5	27	96.4	1	3.6						

40.1	0.9	0.9	25	89.3	3	10.7					
41.1	0.7	1.1	27	96.4	1	3.6					
42.1	0.7		28	100.0							
43.1	0.9	0.3	24	85.7	3	10.7				1	3.6
44.1	0.8	1.2	26	92.9	2	7.1					
45.1	0.8	0.9	23	82.1	5	17.9					
46.1	1.0	0.2	26	92.9	2	7.1					
FOLLOWING PROBLEM WAS CHANGED											
47.1	1.9	3.3	2	7.1	7	25.0					
49.1	4.1	4.9	24	85.7	6	21.4	4	57.1		1	3.6
50.1	0.9	0.5	27	96.4	1	3.6	1	100.0			
51.1	0.8	0.9	27	96.4	1	3.6	1	100.0			
52.1	0.9		28	100.0							
53.1	0.8	1.4	27	96.4	1	3.6	1	100.0			
54.1	1.6	4.7	13	46.4	14	50.0	15	100.0		1	3.6
55.1	0.7	3.9	18	64.3	10	35.7	10	100.0			
56.1	1.2	5.5	26	92.9	2	7.1	2	100.0			
57.1	2.5	8.5	25	89.3	3	10.7					
58.1	1.9	3.9	26	92.9	2	7.1					
59.1	2.9	5.7	25	89.3	3	10.7					
60.1	1.6		28	100.0							
61.1	1.5	0.3	27	96.4	1	3.6					
62.1	0.3	0.5	21	75.0	6	21.4	7	100.0		1	3.6
63.1	2.2	2.3	26	92.9	2	7.1					
64.1	1.8		28	100.0							
64.2	1.3		28	100.0							
65.1	1.3	1.1	27	96.4	1	3.6					
65.2	1.9		28	100.0							
66.1	1.9	2.8	27	96.4	1	3.6					
66.2	1.6	1.4	27	96.4	1	3.6					
67.1	2.2		27	96.4						1	3.6
67.2	3.7	5.1	12	42.9	14	50.0				2	7.1
68.1	2.3		28	100.0							
68.2	2.1	4.2	22	78.6	6	21.4					
69.1	1.7	1.5	27	96.4	1	3.6					
69.2	2.1	7.1	25	89.3	3	10.7					
70.1	1.4		28	100.0							
70.2	2.9	5.9	23	82.1	5	17.9					
71.1	1.7		28	100.0							
71.2	1.8		27	96.4						1	3.6
72.1	1.7		28	100.0							
72.2	5.2	6.0	15	53.6	13	46.4					
FOLLOWING PROBLEM WAS CHANGED											
73.1	1.0	1.6	22	78.6	2	7.1					
74.1	0.8	3.4	25	89.3	2	7.1	3	150.0			
75.1	0.7	1.3	26	92.9	2	7.1	2	100.0			
76.1	0.7	0.5	26	92.9	2	7.1	2	100.0			
77.1	0.7	1.1	26	92.9	2	7.1	2	100.0			
78.1	1.9	1.7	24	85.7	4	14.3					
79.1	1.0	3.0	26	92.9	2	7.1					
FOLLOWING PROBLEM WAS CHANGED											
80.1	0.8	0.6	2	7.1	1	3.6					
82.1	0.5	2.3	17	60.7	33	117.9	10	29.4		1	3.6
83.1	0.5	3.1	22	78.6	5	17.9	5	83.3		1	3.6
84.1	0.5	3.0	14	50.0	9	32.1	10	71.4		5	17.9

FOLLOWING PROBLEM WAS CHANGED

85.1	0.4	1.0	5	17.9	17	60.7	7	38.9	1	3.6
86.1	0.8	0.9	11	39.3	17	60.7	10	58.8		
87.1	1.1	1.1	16	57.1	12	42.9				
88.1	0.8	1.1	23	82.1	5	17.9				
89.1	5.7	3.7	23	82.1	4	14.3			1	3.6
89.2	2.9	5.5	26	92.9	2	7.1				
89.3	4.1	4.4	25	89.3	3	10.7				
90.1	2.5	3.2	12	42.9	16	57.1				
90.2	2.0	3.0	27	96.4	1	3.6				
91.1	1.9		28	100.0						
91.2	2.5	4.3	26	92.9	2	7.1				
92.1	6.4	10.0	22	78.6	4	14.3			2	7.1
93.1	2.8	4.7	13	46.4	14	50.0			1	3.6
93.2	2.0	7.6	24	85.7	3	10.7			1	3.6
94.1	2.1	3.9	26	92.9	2	7.1				
94.2	2.1	3.4	25	89.3	2	7.1			1	3.6
95.1	2.3	4.7	23	82.1	5	17.9				
95.2	3.6	2.0	26	92.9	2	7.1				
96.1	1.7	5.9	23	82.1	5	17.9				
97.1	1.2	1.6	21	75.0	7	25.0				
98.1	1.6	2.3	20	71.4	8	28.6				
99.1	2.0	5.1	12	42.9	16	57.1				
100.1	2.2	2.9	20	71.4	8	28.6				
101.1	1.2	6.1	15	53.6	13	46.4				
102.1	2.5	4.5	13	46.4	15	53.6				
103.1	2.3	2.1	19	67.9	9	32.1				
104.1	3.0	2.2	24	85.7	4	14.3				
105.1	1.7	1.0	26	92.9	2	7.1				
106.1	1.7	2.7	23	82.1	5	17.9				
107.1	3.5	5.2	22	78.6	6	21.4				
108.1	2.9	4.0	20	71.4	8	28.6				
109.1	2.3	3.2	22	78.6	6	21.4				
110.1	4.4	6.5	11	39.3	17	60.7				
111.1	3.3	3.5	26	92.9	2	7.1				
112.1	4.1	2.2	22	78.6	6	21.4				
113.1	3.1	4.3	24	85.7	4	14.3				
114.1	1.1	1.6	22	78.6	5	17.9			1	3.6
115.1	1.1	1.3	27	96.4	1	3.6				
116.1	1.1	4.4	16	57.1	8	28.6			4	14.3
117.1	0.5	1.8	5	17.9	19	67.9			4	14.3
118.1	0.9	2.6	9	32.1	13	64.3			1	3.6
119.1	0.8	1.1	24	85.7	4	14.3	4	100.0		
120.1	0.6	1.0	25	89.3	3	10.7	3	100.0		
121.1	0.7	3.2	19	67.9	7	25.0	7	77.8	2	7.1

END OF DATA ANALYSIS FOR LESSON 62

LESSON 103
NUMBER OF PROBLEMS 204
NUMBER OF STUDENTS WHO COMPLETED THIS LESSON 23

PROB	AVCL	AVWL	TCR	PRCNT	TWRG	PRCNT	TR2	PRCNT	TR3	PRCNT	TTO	PRCNT
1.1	0.9		23	100.0								
2.1	0.8	1.1	17	73.9	6	26.1	6	100.0				
3.1	0.7	1.0	20	87.0	2	8.7	3	100.0			1	4.3
4.1	0.8	0.9	22	95.7	1	4.3	1	100.0				
5.1	0.7	0.9	20	87.0	3	13.0	3	100.0				
6.1	0.7		23	100.0								
7.1	0.7	0.8	21	91.3	2	8.7	2	100.0				
8.1	0.7		23	100.0								
9.1	0.5		23	100.0								
10.1	1.0	2.7	19	82.6	4	17.4	4	100.0				
11.1	0.6	0.6	17	73.9	6	26.1	1	16.7				
12.1	0.6		23	100.0								
13.1	0.6	0.9	22	95.7	1	4.3						
14.1	1.1	2.5	22	95.7	1	4.3	1	100.0				
15.1	0.6		23	100.0								
16.1	1.6	3.4	21	91.3	1	4.3	2	100.0			1	4.3
17.1	0.7		23	100.0								
18.1	0.7		23	100.0								
19.1	0.6	1.1	22	95.7	1	4.3						
20.1	0.6	7.3	20	87.0	3	13.0						
21.1	0.6	2.4	9	39.1	14	60.9						
22.1	0.6	1.1	20	87.0	3	13.0						
23.1	0.7	5.4	20	87.0	2	8.7					1	4.3
24.1	0.6		23	100.0								
25.1	1.0	1.1	22	95.7	1	4.3						
26.1	0.4		23	100.0								
27.1	0.8	0.7	18	78.3	5	21.7						
28.1	1.7	1.8	15	65.2	8	34.8						
29.1	1.2	4.0	17	73.9	6	26.1						
30.1	1.1	5.2	21	91.3	2	8.7						
31.1	3.1	3.3	14	60.9	9	39.1						
32.1	2.3	4.0	17	73.9	6	26.1						
33.1	3.0	3.7	19	82.6	4	17.4						
34.1	1.6		23	100.0								
35.1	2.2	1.6	18	78.3	5	21.7						
36.1	0.9		23	100.0								
37.1	3.9	3.5	7	30.4	16	69.6						
38.1	1.8	2.7	13	56.5	10	43.5						
39.1	1.5	1.5	12	52.2	11	47.8						
40.1	2.0	2.4	14	60.9	9	39.1						
41.1	0.6	3.5	22	95.7	1	4.3						
42.1	0.7	1.9	13	56.5	10	43.5						
43.1	0.8	1.1	15	65.2	8	34.8						
44.1	0.5	1.1	19	82.6	4	17.4						
45.1	1.5	2.5	15	65.2	8	34.8						
46.1	0.9	2.5	12	52.2	11	47.8						
47.1	1.2	2.2	18	78.3	5	21.7						

48.1	1.1	4.1	19	82.6	4	17.4				
49.1	2.2	3.9	19	82.6	4	17.4				
50.1	1.5	0.9	22	95.7	1	4.3				
51.1	2.3	4.1	12	52.2	11	47.8				
52.1		1.7			23	100.0				
53.1	3.6	6.3	16	69.6	7	30.4				
54.1	0.9	2.5	16	69.6	7	30.4	7	100.0		
55.1	1.0	4.3	14	60.9	9	39.1	9	100.0		
56.1	0.6		23	100.0						
57.1	0.5	2.0	20	87.0	3	13.0	3	100.0		
58.1	0.7	3.5	15	65.2	7	30.4	8	100.0	1	4.3
59.1	0.6		23	100.0						
60.1	0.4		23	100.0						
61.1	0.7	6.1	21	91.3	2	8.7	2	100.0		
62.1	0.5		23	100.0						
63.1	0.6	2.1	18	78.3	5	21.7	5	100.0		
64.1	0.6	0.6	21	91.3	2	8.7	2	100.0		
65.1	1.3	4.1	19	82.6	4	17.4				
66.1	1.8	2.0	17	73.9	6	26.1				
67.1	1.6	5.0	22	95.7	1	4.3				
68.1	0.8		23	100.0						
69.1	1.3	1.6	20	87.0	3	13.0				
70.1	0.8	1.2	14	60.9	9	39.1				
71.1	0.6	1.6	20	87.0	3	13.0				
72.1	0.6	0.5	20	87.0	3	13.0				
73.1	1.3	3.1	22	95.7	1	4.3				
74.1	1.4	3.5	20	87.0	3	13.0				
75.1	2.0	1.0	22	95.7	1	4.3				
76.1	1.2	3.4	12	52.2	11	47.8				
77.1	1.1	2.6	15	65.2	8	34.8				
78.1	1.4		23	100.0						
79.1	0.9		23	100.0						
80.1	0.6	1.1	19	82.6	4	17.4				
81.1	0.6		23	100.0						
82.1	0.7	0.7	17	73.9	6	26.1				
83.1	0.6	0.8	12	52.2	11	47.8				
84.1	1.2	5.3	19	82.6	4	17.4				
85.1	0.7	0.8	21	91.3	2	8.7	2	100.0		
86.1	0.8	1.7	17	73.9	5	21.7	6	100.0	1	4.3
87.1	0.7	1.3	19	82.6	4	17.4	4	100.0		
88.1	0.7	1.8	19	82.6	4	17.4	4	100.0		
89.1	0.7		23	100.0						
90.1	0.7	0.6	20	87.0	3	13.0	3	100.0		
91.1	0.7	2.8	21	91.3	2	8.7	2	100.0		
92.1	0.5		23	100.0						
93.1	0.5	0.6	22	95.7	1	4.3	1	100.0		
94.1	0.8		23	100.0						
95.1	0.7	3.8	16	69.6	7	30.4	7	100.0		
96.1	0.5	0.6	22	95.7	1	4.3	1	100.0		
97.1	0.6		23	100.0						
98.1	0.7		23	100.0						
99.1	0.8		23	100.0						
100.1	0.7		23	100.0						
101.1	1.2	3.1	20	87.0	3	13.0				
102.1	0.7		23	100.0						

103.1	0.8	3.4	22	95.7	1	4.3				
104.1	3.0	6.2	20	87.0	3	13.0				
105.1	1.7	4.8	20	87.0	3	13.0				
106.1	0.8	3.9	22	95.7	1	4.3				
107.1	0.8	2.6	19	82.6	4	17.4				
108.1	0.5		23	100.0						
109.1	0.9	2.4	20	87.0	3	13.0				
110.1	0.7	1.2	21	91.3	2	8.7				
111.1	0.6		23	100.0						
112.1	0.6		23	100.0						
113.1	0.7	1.0	21	91.3	2	8.7				
114.1	1.5	4.4	20	87.0	3	13.0				
115.1	0.8		23	100.0						
116.1	2.6	3.3	14	60.9	9	39.1				
117.1	1.1	2.8	20	87.0	3	13.0				
118.1	0.8		23	100.0						
119.1	1.3	1.8	21	91.3	2	8.7				
120.1	1.7	3.5	18	78.3	5	21.7				
121.1	0.7	3.2	13	56.5	10	43.5				
122.1	0.7	1.1	19	82.6	4	17.4				
123.1	0.7	1.3	17	73.9	6	26.1				
124.1	0.8	0.8	21	91.3	2	8.7	1	50.0		
125.1	0.5	0.1	21	91.3	2	8.7	1	50.0		
126.1	0.7		23	100.0						
127.1	0.7	0.9	19	82.6	4	17.4	4	100.0		
128.1	0.8	1.9	15	65.2	8	34.8	7	87.5		
129.1	0.6	0.5	21	91.3	2	8.7	2	100.0		
130.1	0.7	1.1	21	91.3	2	8.7	2	100.0		
131.1	0.7	0.7	21	91.3	2	8.7	2	100.0		
132.1	0.6	0.7	15	65.2	8	34.8	8	100.0		
133.1	0.5		23	100.0						
134.1	0.8	2.9	14	60.9	8	34.8	9	100.0	1	4.3
135.1	0.9	2.8	12	52.2	10	43.5	11	100.0	1	4.3
136.1	1.0	2.8	19	82.6	4	17.4	4	100.0		
137.1	0.7	1.1	20	87.0	3	13.0	3	100.0		
138.1	0.5	3.1	22	95.7	1	4.3	1	100.0		
139.1	0.8	0.6	16	69.6	7	30.4	5	71.4		
140.1	0.7	1.0	10	43.5	13	56.5				
141.1	0.7	1.3	15	65.2	8	34.8				
142.1	0.6	1.6	9	39.1	13	56.5			1	4.3
143.1	2.0	3.6	14	60.9	9	39.1				
144.1	1.5	2.2	22	95.7	1	4.3				
145.1	1.3	3.8	13	56.5	8	34.8	10	100.0	2	8.7
146.1	0.8	2.0	22	95.7	1	4.3	1	100.0		
147.1	1.1	2.9	15	65.2	7	30.4	8	100.0	1	4.3
148.1	0.7	1.2	22	95.7	1	4.3				
149.1	1.4	2.6	20	87.0	2	8.7	3	100.0	1	4.3
150.1	0.5	3.3	21	91.3	2	8.7	2	100.0		
151.1	0.7	5.3	18	78.3	5	21.7	5	100.0		
152.1	1.0	3.1	20	87.0	3	13.0	3	100.0		
153.1	0.4	1.1	21	91.3	2	8.7	2	100.0		
154.1	0.6	1.1	21	91.3	2	8.7	2	100.0		
155.1	0.8	1.7	19	82.6	4	17.4	4	100.0		
156.1	0.4	0.7	22	95.7	1	4.3	1	100.0		
157.1	0.5	6.7	22	95.7	1	4.3	1	100.0		

153.1	0.6		23	100.0							
159.1	0.5	0.7	22	95.7	1	4.3	1	100.0			
160.1	0.7	4.0	17	73.9	6	26.1					
161.1	0.9	1.3	13	56.5	10	43.5					
162.1	0.7	1.3	6	26.1	16	69.6			1	4.3	
163.1	0.6	5.3	21	91.3	2	8.7					
164.1	0.7	0.8	13	56.5	10	43.5					
165.1	0.6	0.6	14	60.9	9	39.1					
166.1	1.4	2.9	5	21.7	17	73.9			1	4.3	
167.1	1.2	3.2	17	73.9	6	26.1					
168.1	1.6	4.3	12	52.2	10	43.5			1	4.3	
169.1	1.2	2.8	16	69.6	7	30.4					
170.1	0.9	3.0	11	47.8	11	47.8			1	4.3	
171.1	0.6	3.3	16	69.6	7	30.4					
172.1	1.7	4.0	3	13.0	20	87.0					
173.1	1.4	4.3	15	65.2	8	34.8					
174.1	3.2	3.3	13	56.5	10	43.5					
175.1	1.2	3.5	13	56.5	10	43.5					
176.1	1.7	2.5	13	56.5	8	34.8			2	8.7	
177.1	1.3	5.1	15	65.2	7	30.4	6	75.0	1	4.3	
178.1	1.6	5.7	12	52.2	10	43.5	11	100.0	1	4.3	
179.1	0.8	1.4	18	78.3	5	21.7	4	80.0			
180.1	1.0	2.9	17	73.9	6	26.1	6	100.0			
181.1	1.1	5.4	20	87.0	3	13.0	3	100.0			
182.1	0.6		23	100.0							
183.1	0.9	1.6	14	60.9	9	39.1	9	100.0			
184.1	0.5	0.4	21	91.3	2	8.7	2	100.0			
185.1	0.8	2.8	18	78.3	4	17.4	5	100.0	1	4.3	
186.1	0.7	1.0	21	91.3	2	8.7	2	100.0			
187.1	0.7	1.0	22	95.7	1	4.3	1	100.0			
188.1	0.8	1.3	19	82.6	4	17.4	4	100.0			
189.1	0.5	0.8	20	87.0	3	13.0	3	100.0			
190.1	0.5	3.1	20	87.0	3	13.0	3	100.0			
191.1	0.6	1.6	18	78.3	5	21.7	5	100.0			
192.1	0.6	0.6	21	91.3	2	8.7	2	100.0			
193.1	0.5	1.6	21	91.3	2	8.7	2	100.0			
194.1	0.9	4.6	14	60.9	9	39.1					
195.1	1.1	1.6	15	65.2	8	34.8					
196.1	1.5	4.3	9	39.1	13	56.5			1	4.3	
197.1	1.8	3.2	10	43.5	12	52.2			1	4.3	
198.1	0.8	7.0	18	78.3	5	21.7					
199.1	0.9	4.4	18	78.3	5	21.7					
200.1	1.1	3.7	17	73.9	6	26.1					
201.1	1.3	2.7	15	65.2	8	34.8					
202.1	1.0		22	95.7					1	4.3	
203.1	0.9	2.5	22	95.7	1	4.3					
204.1	1.0		23	100.0							
205.1	1.2		4	17.4							
206.1	1.0		4	17.4							

END OF DATA ANALYSIS FOR LESSON 103

Appendix 10

Summary of Grammatical Material

First Half of Fall Quarter

Sessions 1-26

Alphabet: All letters except hard sign--printed and written. Orthorgraphic rules for writing of vowel letters, soft sign and [-j-/. (For transliteration equivalents, see Appendix 2, Table 1.)

Phonology: All vowel and consonant phonemes. Major allophones of stressed and unstressed vowels. Devoicing of obstruents in final position and before voiceless obstruents. Contrasts of type C + j + V vs. C'V. Assimilation of dental fricatives to following palatal. Assimilative voicing of obstruents.

Morphology:

Adjective: Masculine and feminine long forms of the nominative, genitive, accusative, prepositional, and instrumental singular from stems in: (a) paired plain consonants; (b) velars; and (c) palatals.

Noun: First and second declension accusative, genitive, prepositional, and instrumental singular from stems in: (a) all paired consonants; (b) velars; (c) palatals (including stems in -ij); and (d) [-c-/, with stem or desinence stress. Loss of mobile vowel in oblique cases of certain masculines with nominative singular in a consonant. Inflection of foreign names in a consonant--masculine and feminine.

Pronoun:

Personal: [>, on, ona, my, vy, oni-/ in nominative, genitive, prepositional and instrumental. Use of initial [-n-/ in third person when object of preposition.

Interrogative: [-kto, hto-/ in same cases as personal pronouns. [-kakoj-/ in same forms as adjective. [-hej-/ in nominative and accusative masculine and feminine.

Possessive: [-moj, naw, vaw, svoj-/ in same forms as adjective. Uninflected [-ego, e←, ix-. Use of [-svoj-/ with third person subjects.

Verb: Regular endings of all present tense forms except second person singular. Endings of past except for neuter. Infinitive and third plural present as "basic forms." Rules for stress of first singular present. Consonant alternations in first singular present tense. Present of [-xotet;-/.

Syntax:

Prepositions: Governing genitive--[-u-/. Governing instrumental--za, nad(o), pered(o), pod(o), s(o). Governing prepositional-- o-ob-obo, v(o), na.

Case usage in other environments: Accusative of direct object. Genitive of possession and after [-bo>t;s>-/. Instrumental of means, predicate instrumental after [-byt;-/, and instrumental with [-upravl>t;, interesovat;s>, kazat;s>, shitat;-/ and [-shitat;s>-/.

Conjunctions: [-i-/ vs. [-a-/ vs. [-no-/.

Other: Rendering of "to have" constructions with [-u-/ plus the genitive.

Second Half of Fall Quarter
Sessions 27-46

Alphabet: The hard sign. Value of [-g-/ before [-k-.

Phonology: Allophone of [-i-/ after [-c-.

Morphology:

Adjective: Neuter singular (all cases covered in first half of term.) Dative singular of all three genders.

Noun: Singular of neuters in [-o-/ or [-e-/ (for all cases covered in first half of term). Dative singular of all classes introduced up to this point. Masculines in [-a-/ (all singular forms).

Pronoun:

Personal: Dative case of all mentioned in preceding half term. Declension of [-ono-.

Interrogative: Dative singular of [-kto, hto, kakoj-./ Neuter of [-kakoj-.

Possessive: Dative case of all mentioned in preceding half term. Neuter of same group.

Demonstrative: Masculine, feminine, neuter singular of [-]tot-/ and [-tot-.

Relative: [-kotoryj-/ --same forms as long adjective. Agreement with antecedent in gender and number. Case determined by role in relative clause. As object of preposition. As translation of "whose" in relative clauses.

Negated: Declension of [-nihto-/ and [-nikto-./ Insertion of preposition between [-ni-/ and remainder of form.

Verb: Regular forms of imperative plural. Infinitive, past, and (except for the second singular) present of [-est;-./ Future of imperfective verbs.

Adverbs: Generation of adverbs and impersonal forms in [-o-/ from adjectives. Formation and use of type [-po-russki-.

Syntax:

Prepositions: Governing dative-- [-k(o)-/ and [-po-.

Case usage in other environments: Genitive with adverbs of quantity. Dative as indirect object, as subject of impersonal constructions, and after

[-zvonit;, otvehat;, pomogat;-/ and [-uhit;s>- .

Conjunctions: [-ni ... ni-/ with negated verbs.

Other: Negated verb with [-nikogda, nikto-/, etc. Use of past forms with [->, my, vy-./ Use of future in relative clauses with [-kogda-.

First Half of Winter Quarter

Sessions 47-67

Morphology:

Adjective: Long plural forms, all cases. Long forms of adjectives with stem in a paired palatalized consonant.

Noun: Regular desinences of all plural cases for all nouns covered so far. Regular insertion of vowel in certain genitive plurals. Nominative plural in [-a-/ for masculines. Irregular desinences or vowel insertion in genitive.

Pronoun:

Personal: Inflection and use of [-ty-.

Other: Plural of all possessive, interrogative, demonstrative and relative pronouns previously introduced. Inflection of [-ves;-/ and [-tvoj-.

Number: Nominative forms of cardinal numbers 1 through 8. Oblique forms of 1 and 2 through 4. Agreement of noun and adjective with preceding number.

Verb: Perfective vs. imperfective aspect. Future of perfective verbs. The second person singular of the present. The singular imperative. The inflexion of [-dat;-.

Syntax:

Prepositions: Governing accusative--[-za-./ Governing genitive--[-krome, bez-./ Governing instrumental--[-meqdu-.

Case usage in other environments: Genitive of measure, direct object of negated verb, and after [-izbegat;-.

Other: Indirect discourse--statements and questions. Use of [-kak-/ in inquiring about surnames.

Second Half of Winter Quarter

Sessions 68-92

Morphology:

Adjective: Analytic comparative. Analytic superlative.

Noun: Declension of feminine in a consonant. Declension of [-mat;-/ and [-doh;-, -im>-/ and [-vrem>-./ Irregular plurals to [-syn, drug, brat, muq, stul-/, etc. Plural to singulatives in [-in-./ Additional irregular genitive plurals.

Pronoun: Inflection and use of [-kaqdyj-/ and [-takoj-.

Number: Inflection of cardinals 5 through 20 and 30. Compound numbers 21 through 29, 31 through 39. Agreement of nouns and adjectives with all forms of all numbers introduced. Ordinals of all cardinals introduced.

Verb: Irregular imperatives. Second singular present of [-dat;-/ and [-est;-./ Determinate and indeterminate aspect in verbs of motion.

Syntax:

Prepositions: Governing the genitive-- [-do, iz, ot, s-./ Governing the accusative-- [-v-/ and [-na-/ after verbs of motion, and [-herez-.

Case usage in other environments: Accusative of duration.

Other: Expressions of date of month and day of week.

First Half of Spring Quarter

Sessions 93-111

Morphology:

Adjective: Short forms

Pronoun:

Indefinite: Compounds with [-hto-/ and [-nibud;-.

Emphatic: Inflection and use of [-sam-.

Number: Cardinals and ordinals 40 through 100. [-poltora, poltory-.

Verb: Forms of [-leh;, moh;, beqat;-. Prefixed verbs of motion. The conditional mood. Third person optative.

Adverbs: Goal of motion vs. location ([-gde-/ vs. [-kuda-,/, etc.

Syntax:

Prepositions: Words requiring [-na-/ as opposed to [-v-.

Case usage: Instrumental after [-dovol;nyj-/. Use of dative and accusative with various meanings of [-uhit;-/.

Conjunctions: Infinitive vs. past tense in constructions with [-htoby-.

Other: Imperative in indirect discourse.

Second Half of Spring Quarter

Sessions 112-135

Morphology:

Adjective: Synthetic comparative. Synthetic superlative.

Noun: Indeclinable nouns.

Pronoun: Rendering of constructions of type "whatever," "whenever," etc. Remaining forms of [-ves;-/.

Number: Cardinals and ordinals 200 through 1,000,000. [-oba, obe-/. Rendering of English two and a half, etc.

Verb: The inclusive imperative. Uses of [-est;-/ --"there is, are." Compounds with [-po-/ and [-za-/. Present and past verbal adverbs. Present active, past active, and past passive participles.

Adverb: Formation and use of type [-po-svoemu-./ Comparative.

Syntax:

Prepositions: Governing genitive-- [-dl>, posle, mimo, okolo, bez-/ and [-vmesto-/. Governing accusative-- [-na-/ "for."

Case usage in other environments: Instrumental with [-zan>toj, okazat;s>-/. Instrumental and/or accusative with [-zvat;-./ Genitive of comparison.

Conjunctions: Compound conjunctions of type [-posle togo, kak-./

Other: Time of day. Designation of year. Idiomatic constructions with comparative.

Appendix 11

Common Portions of Final Examinations--

Autumn, Winter, and Spring Quarters

FIRST-YEAR RUSSIAN

Final Examination - Autumn Quarter

A. Translate into Russian (80 minutes)

1. My rich brother often drank a lot of vodka, but he rarely ate much meat.
2. The girl, about whom we were talking, plays the piano very badly.
3. Did you know that this handsome young American is a Russian teacher?
4. Why doesn't he want to write with his pencil? He knows that I don't have a pen.
5. It's easy for you to speak English because your father was an American.
6. The letter, which they were writing to their leader, is lying on the desk in their room.
7. When we lived in England we had neither an automobile nor a house.
8. Tomorrow they will have both a new lesson and a short examination.
9. I like to help him, but I don't want to talk with him about my lecture.
10. My friend's home is on this street in that large building.
11. In the summer I live in a cottage in the country with my wife and her sister.
12. Do you remember the old doctor whose son was a student at the university when you worked at the bank?
13. It's very difficult to talk with this comrade. He's always smoking and he doesn't listen to anyone.
14. The woman, who is sitting with the professor and the journalist, thinks that Anna will be a good writer.
15. Don't you understand that one must never smoke a pipe in her bedroom?
16. Why are you reading that book? It's mine! And the chair you're sitting on is mine too.
17. Why don't you answer her when she asks you about them?
18. They always telephone me in the morning when I'm sleeping.
19. She never explained anything to us, and we never talked about anything with her.
20. The woman in the white dress was formerly a teacher, and the man in the black suit wants to be a rich engineer.

21. In the winter we ate bread and butter and drank good fresh milk.

22. Whose secretary understands English, his or yours?

23. That stupid student works very slowly. Her teacher thinks that she never does anything.

24. She has a very intelligent husband, and her brother has a beautiful and rich wife.

25. I see very well that you don't want to talk with me about that.

FINAL EXAMINATION - March 21, 1968

A. Translate into Russian (80 minutes)

1. The teachers explain the new rules, and the students write down everything immediately.

2. Do you have any brothers? Yes, I have seven brothers.

3. On this street there are two famous museums and many small but interesting stores.

4. When I am in Russia I shall read only Russian newspapers.

5. As soon as I have supper, I shall write to father.

6. Our professor said that on Tuesday he would speak about English cities.

7. Anna began reading this novel two weeks ago but she still hasn't finished reading it. She never finishes long novels!

8. I finally asked Zoya where she was going in such a beautiful dress, but she didn't answer me.

9. I don't understand a single word in the third lesson!

10. There were only twelve people at the first lecture.

11. How much did you pay for these two Russian dictionaries? I paid only eight rubles for them.

12. We lived in American 20 years.

13. Did you see those beautiful girls who were sitting in the garden?

14. Don't forget to ask Sonya to come to see me next Friday.

15. When you come home this evening, please buy a bottle of wine.

16. Anna isn't home. She went to Moscow by train three days ago.

17. Ivan wrote that he would leave France in a week.

18. Uncle Andrew used to walk to the bank but now he drives.

19. I am going to a concert tomorrow. Do you (familiar) want to go with me?

20. Never give children cigarettes!

21. Look at that stupid man! He is eating meat with a spoon.

22. In the winter they get up late and go to bed early.

23. Why are your little sisters afraid of Englishmen?

24. Your friends' daughters seem to be intelligent girls.

25. Your skirt is lyirg there under those old magazines.

FINAL EXAMINATION - June, 1968

Time: 2 hours.

1. She wanted me to tell her why their apartment is 10 dollars cheaper than ours.

2. This examination will end at 4:45 P.M.

3. I asked the woman sitting in front of me to take off her hat.

4. Having become interested in Chekov, Igor, the smartest student in our class, read all his writings last summer.

5. Having dropped in on Anna, I chatted a bit with her about the article written by her husband.

6. No matter whom I asked, I could not find a single person who knew -- use participle! -- where they had taken the poor old man.

7. Having returned from the store Anna told me to put all the things bought by her on the shelf.

8. Tolstoy died on January 29, 1837.

9. Although my nephew Andrew is studying mathematics at the university, he rarely studies.

10. If you are free next week, let's go to the country.

11. This evening my sister will have dinner at our place.

12. She often brings her friends to our house.

13. On Sundays we always carry the table and chairs out into the garden.

14. I hope they will leave in half an hour, not later.

15. He asked whether we would be home in the evening.

16. Which of these armchairs is the cheapest one--the white one or the black one?

17. It's easier to write with a pen than with this little pencil.

18. As soon as I began to talk about that, Ivan left.

19. How do you like your new house? It is just as beautiful as ours and much bigger.

20. I used to have to get up at six A.M. in order to get -- arrive at -- to work.

21. Today is Saturday, the eighth of June, nineteen hundred and sixty-eight.

22. While standing at the board, the professor said for us to put all our books under our chairs.

23. I translated the first thirty-one short sentences from English into Russian.

24. At half past three I suddenly felt like taking a little walk.

25. Having given my things to the teacher, I went out of the room in which the students were working.

26. Before returning to the examination I bought a glass of fresh milk from a well-dressed young woman. She told me to hurry, because it was already after three.

27. Having understood that I had stayed too long, I put on the table the milk sold to me by the young woman and ran into the school.

28. On the way to the classroom, at five minutes after three, I noticed that thirty two minutes had already passed.

29. Having entered the room, I went up to the teacher and started to explain why I was late.

30. He answered me with these words -- please speak somewhat more slowly -- the quieter the better! Here's your notebook, but your place has been occupied by the professor's nephew.

31. You will have to sit on the floor.

32. If I had not been afraid of the man's brothers, I would have left immediately, but having understood that I myself had made the mistake, I took my pencil and sat down on the floor.

Appendix 12

Summary by Sequence of Type and Content

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 1 - 19

CONTENT ITEM TYPE	SAME SAME	SAME DIFF.	DIFFERENT SAME	DIFFERENT DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	101	50
AVERAGE CORRECT	0.0	0.0	61.9	61.7
SAMPLE VAR.	0.0	0.0	625.8	734.9
AV. COR. LATENCY	0.0	0.0	1.0	1.0
SAMPLE VAR.	0.0	0.0	0.1	0.2
TRANSLATE				
NO. OF ITEMS	1	0	305	175
AVERAGE CORRECT	94.7	0.0	72.4	60.4
SAMPLE VAR.	0.0	0.0	472.8	623.7
AV. COR. LATENCY	0.7	0.0	1.0	1.1
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSCRIBE				
NO. OF ITEMS	1	0	115	80
AVERAGE CORRECT	96.6	0.0	73.9	63.7
SAMPLE VAR.	0.0	0.0	483.8	748.6
AV. COR. LATENCY	1.3	0.0	0.7	1.4
SAMPLE VAR.	0.0	0.0	0.1	1.7
TRANSFORM				
NO. OF ITEMS	0	0	25	11
AVERAGE CORRECT	0.0	0.0	75.9	77.1
SAMPLE VAR.	0.0	0.0	414.9	390.0
AV. COR. LATENCY	0.0	0.0	1.2	1.1
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSFORM INFLECTION				
NO. OF ITEMS	64	6	66	48
AVERAGE CORRECT	88.2	86.5	76.7	77.0
SAMPLE VAR.	189.1	123.6	458.7	298.7
AV. COR. LATENCY	1.0	1.2	1.2	1.5
SAMPLE VAR.	0.2	0.2	0.3	0.7
INFLECT				
NO. OF ITEMS	162	22	302	160
AVERAGE CORRECT	96.4	94.4	74.9	76.6
SAMPLE VAR.	49.0	84.4	462.6	469.5
AV. COR. LATENCY	1.7	2.3	2.5	2.9
SAMPLE VAR.	0.7	2.4	1.4	1.9
TRANSLATE & INFLECT				
NO. OF ITEMS	0	0	23	9
AVERAGE CORRECT	0.0	0.0	69.4	68.9
SAMPLE VAR.	0.0	0.0	535.2	354.7
AV. COR. LATENCY	0.0	0.0	2.0	1.6
SAMPLE VAR.	0.0	0.0	0.8	0.2

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 20 - 33

CONTENT / ITEM TYPE	SAME		DIFFERENT	
	SAME	DIFF.	SAME	DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	73	29
AVERAGE CORRECT	0.0	0.0	71.4	66.3
SAMPLE VAR.	0.0	0.0	456.7	463.4
AV. COR. LATENCY	0.0	0.0	0.9	0.8
SAMPLE VAR.	0.0	0.0	0.1	0.0
TRANSLATE				
NO. OF ITEMS	1	0	185	144
AVERAGE CORRECT	100.0	0.0	77.0	59.1
SAMPLE VAR.	0.0	0.0	416.2	617.5
AV. COR. LATENCY	0.8	0.0	0.9	1.0
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSCRIBE				
NO. OF ITEMS	0	0	161	74
AVERAGE CORRECT	0.0	0.0	80.7	68.7
SAMPLE VAR.	0.0	0.0	250.6	605.9
AV. COR. LATENCY	0.0	0.0	0.7	0.7
SAMPLE VAR.	0.0	0.0	0.2	0.0
TRANSFORM				
NO. OF ITEMS	0	0	17	8
AVERAGE CORRECT	0.0	0.0	72.3	79.6
SAMPLE VAR.	0.0	0.0	311.7	131.6
AV. COR. LATENCY	0.0	0.0	1.0	1.1
SAMPLE VAR.	0.0	0.0	0.1	0.0
TRANSFORM INFLECTION				
NO. OF ITEMS	29	3	70	51
AVERAGE CORRECT	89.9	91.7	73.7	80.7
SAMPLE VAR.	106.7	81.2	549.8	426.5
AV. COR. LATENCY	0.9	0.8	0.9	1.2
SAMPLE VAR.	0.2	0.0	0.1	0.5
INFLECT				
NO. OF ITEMS	281	46	398	204
AVERAGE CORRECT	95.3	96.2	80.2	76.5
SAMPLE VAR.	113.1	46.5	454.2	452.3
AV. COR. LATENCY	1.4	1.3	2.3	2.7
SAMPLE VAR.	0.4	0.5	1.0	1.2
TRANSLATE & INFLECT				
NO. OF ITEMS	7	2	56	30
AVERAGE CORRECT	98.0	79.2	75.7	75.5
SAMPLE VAR.	12.0	206.0	614.4	365.8
AV. COR. LATENCY	1.4	2.0	1.6	1.8
SAMPLE VAR.	0.4	1.0	0.3	0.3

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 34 - 46

CONTENT ITEM TYPE	SAME SAME	SAME DIFF.	DIFFERENT SAME	DIFFERENT DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	41	13
AVERAGE CORRECT	0.0	0.0	83.5	86.4
SAMPLE VAR.	0.0	0.0	184.4	84.2
AV. COR. LATENCY	0.0	0.0	0.8	0.7
SAMPLE VAR.	0.0	0.0	0.1	0.0
TRANSLATE				
NO. OF ITEMS	4	0	297	70
AVERAGE CORRECT	76.8	0.0	77.2	79.0
SAMPLE VAR.	276.5	0.0	473.7	281.4
AV. COR. LATENCY	0.8	0.0	0.9	0.9
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSCRIBE				
NO. OF ITEMS	0	0	66	38
AVERAGE CORRECT	0.0	0.0	82.9	74.5
SAMPLE VAR.	0.0	0.0	226.2	577.3
AV. COR. LATENCY	0.0	0.0	0.6	0.6
SAMPLE VAR.	0.0	0.0	0.0	0.0
TRANSFORM				
NO. OF ITEMS	0	0	12	4
AVERAGE CORRECT	0.0	0.0	75.6	87.1
SAMPLE VAR.	0.0	0.0	382.2	403.7
AV. COR. LATENCY	0.0	0.0	0.9	0.9
SAMPLE VAR.	0.0	0.0	0.1	0.0
TRANSFORM INFLECTION				
NO. OF ITEMS	0	0	76	11
AVERAGE CORRECT	0.0	0.0	64.6	82.0
SAMPLE VAR.	0.0	0.0	370.5	202.5
AV. COR. LATENCY	0.0	0.0	1.2	0.9
SAMPLE VAR.	0.0	0.0	0.5	0.2
INFLECT				
NO. OF ITEMS	173	6	566	96
AVERAGE CORRECT	96.8	95.6	86.5	87.8
SAMPLE VAR.	51.2	14.5	257.7	164.6
AV. COR. LATENCY	1.3	1.1	2.1	2.2
SAMPLE VAR.	0.4	0.1	1.1	0.7
TRANSLATE & INFLECT				
NO. OF ITEMS	8	0	59	24
AVERAGE CORRECT	95.0	0.0	83.6	84.8
SAMPLE VAR.	26.5	0.0	245.2	167.0
AV. COR. LATENCY	1.1	0.0	1.4	1.6
SAMPLE VAR.	0.1	0.0	0.3	0.4

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 47 - 65

CONTENT ITEM TYPE	SAME SAME	SAME DIFF.	DIFFERENT SAME	DIFFERENT DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	92	38
AVERAGE CORRECT	0.0	0.0	73.8	69.7
SAMPLE VAR.	0.0	0.0	574.3	491.3
AV. COR. LATENCY	0.0	0.0	0.8	0.9
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSLATE				
NO. OF ITEMS	0	1	246	76
AVERAGE CORRECT	0.0	100.0	84.2	78.3
SAMPLE VAR.	0.0	0.0	236.6	376.7
AV. COR. LATENCY	0.0	0.9	0.8	0.7
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSCRIBE				
NO. OF ITEMS	0	0	64	21
AVERAGE CORRECT	0.0	0.0	90.1	79.9
SAMPLE VAR.	0.0	0.0	82.8	698.0
AV. COR. LATENCY	0.0	0.0	0.7	0.6
SAMPLE VAR.	0.0	0.0	0.0	0.0
TRANSFORM				
NO. OF ITEMS	0	0	5	2
AVERAGE CORRECT	0.0	0.0	30.4	76.7
SAMPLE VAR.	0.0	0.0	166.7	768.3
AV. COR. LATENCY	0.0	0.0	0.9	0.7
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSFORM INFLECTION				
NO. OF ITEMS	28	0	102	41
AVERAGE CORRECT	96.6	0.0	87.5	85.3
SAMPLE VAR.	24.1	0.0	124.8	211.5
AV. COR. LATENCY	0.8	0.0	0.8	0.9
SAMPLE VAR.	0.0	0.0	0.1	0.1
INFLECT				
NO. OF ITEMS	127	14	465	125
AVERAGE CORRECT	95.8	94.5	84.6	82.2
SAMPLE VAR.	45.3	77.6	300.6	325.3
AV. COR. LATENCY	1.6	2.1	2.4	3.4
SAMPLE VAR.	0.8	1.4	1.4	2.5
TRANSLATE & INFLECT				
NO. OF ITEMS	3	0	88	32
AVERAGE CORRECT	68.7	0.0	72.9	71.3
SAMPLE VAR.	543.5	0.0	400.8	578.4
AV. COR. LATENCY	1.1	0.0	1.0	1.3
SAMPLE VAR.	0.1	0.0	0.1	0.3

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 66 - 79

CONTENT ITEM TYPE	SAME SAME	SAME DIFF.	DIFFERENT SAME	DIFFERENT DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	122	37
AVERAGE CORRECT	0.0	0.0	78.9	70.4
SAMPLE VAR.	0.0	0.0	348.4	424.8
AV. COR. LATENCY	0.0	0.0	0.8	0.8
SAMPLE VAR.	0.0	0.0	0.3	0.1
TRANSLATE				
NO. OF ITEMS	0	0	201	77
AVERAGE CORRECT	0.0	0.0	87.4	71.8
SAMPLE VAR.	0.0	0.0	227.0	548.2
AV. COR. LATENCY	0.0	0.0	0.8	0.7
SAMPLE VAR.	0.0	0.0	0.0	0.2
TRANSCRIBE				
NO. OF ITEMS	0	0	97	27
AVERAGE CORRECT	0.0	0.0	93.4	87.6
SAMPLE VAR.	0.0	0.0	90.3	277.5
AV. COR. LATENCY	0.0	0.0	0.6	0.7
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSFORM				
NO. OF ITEMS	1	0	22	6
AVERAGE CORRECT	90.9	0.0	82.3	66.8
SAMPLE VAR.	0.0	0.0	629.0	364.4
AV. COR. LATENCY	0.6	0.0	0.9	1.6
SAMPLE VAR.	0.0	0.0	0.1	0.6
TRANSFORM INFLECTION				
NO. OF ITEMS	10	0	128	24
AVERAGE CORRECT	94.9	0.0	80.1	81.0
SAMPLE VAR.	20.8	0.0	256.1	268.6
AV. COR. LATENCY	0.7	0.0	1.0	1.0
SAMPLE VAR.	0.0	0.0	0.1	0.1
INFLECT				
NO. OF ITEMS	50	2	497	103
AVERAGE CORRECT	96.5	92.3	83.9	81.7
SAMPLE VAR.	18.9	118.6	302.1	313.8
AV. COR. LATENCY	1.7	3.1	2.2	3.3
SAMPLE VAR.	0.6	9.7	1.1	2.0
TRANSLATE & INFLECT				
NO. OF ITEMS	2	0	53	32
AVERAGE CORRECT	94.3	0.0	81.1	70.7
SAMPLE VAR.	66.1	0.0	244.5	686.0
AV. COR. LATENCY	1.2	0.0	0.9	1.4
SAMPLE VAR.	0.0	0.0	0.1	1.2

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 80 - 92

CONTENT / ITEM TYPE	SAME		DIFFERENT	
	SAME	DIFF.	SAME	DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	15	6
AVERAGE CORRECT	0.0	0.0	74.8	78.6
SAMPLE VAR.	0.0	0.0	209.9	260.9
AV. COR. LATENCY	0.0	0.0	0.8	0.8
SAMPLE VAR.	0.0	0.0	0.1	0.0
TRANSLATE				
NO. OF ITEMS	0	0	387	96
AVERAGE CORRECT	0.0	0.0	80.7	69.9
SAMPLE VAR.	0.0	0.0	337.3	552.0
AV. COR. LATENCY	0.0	0.0	0.8	0.7
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSCRIBE				
NO. OF ITEMS	0	0	52	14
AVERAGE CORRECT	0.0	0.0	94.3	75.0
SAMPLE VAR.	0.0	0.0	49.8	148.3
AV. COR. LATENCY	0.0	0.0	0.6	0.9
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSFORM				
NO. OF ITEMS	1	0	8	3
AVERAGE CORRECT	95.5	0.0	84.7	69.7
SAMPLE VAR.	0.0	0.0	153.2	173.3
AV. COR. LATENCY	0.6	0.0	0.7	1.0
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSFORM INFLECTION				
NO. OF ITEMS	6	0	57	26
AVERAGE CORRECT	90.3	0.0	75.9	66.2
SAMPLE VAR.	43.6	0.0	375.5	692.0
AV. COR. LATENCY	0.7	0.0	0.8	0.9
SAMPLE VAR.	0.0	0.0	0.1	0.1
INFLECT				
NO. OF ITEMS	95	1	716	135
AVERAGE CORRECT	94.3	100.0	86.3	80.8
SAMPLE VAR.	85.0	0.0	290.1	328.7
AV. COR. LATENCY	1.3	2.6	1.8	2.6
SAMPLE VAR.	0.4	0.0	0.8	1.1
TRANSLATE & INFLECT				
NO. OF ITEMS	10	1	118	51
AVERAGE CORRECT	94.9	93.3	79.4	78.3
SAMPLE VAR.	12.4	0.0	432.4	553.3
AV. COR. LATENCY	1.2	2.4	1.3	1.6
SAMPLE VAR.	0.4	0.0	0.5	1.1

SUMMARY BY SEQUENCE OF TYPE AND CONTENT
LESSONS 93 - 135

CONTENT ITEM TYPE	SAME SAME	SAME DIFF.	DIFFERENT SAME	DIFFERENT DIFF.
TYPE ANSWERS				
NO. OF ITEMS	0	0	0	0
AVERAGE CORRECT	0.0	0.0	0.0	0.0
SAMPLE VAR.	0.0	0.0	0.0	0.0
AV. COR. LATENCY	0.0	0.0	0.0	0.0
SAMPLE VAR.	0.0	0.0	0.0	0.0
TRANSLATE				
NO. OF ITEMS	0	0	557	183
AVERAGE CORRECT	0.0	0.0	79.8	70.0
SAMPLE VAR.	0.0	0.0	378.7	525.0
AV. COR. LATENCY	0.0	0.0	0.7	0.6
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSCRIBE				
NO. OF ITEMS	0	0	153	44
AVERAGE CORRECT	0.0	0.0	94.3	93.9
SAMPLE VAR.	0.0	0.0	54.0	105.0
AV. COR. LATENCY	0.0	0.0	0.6	0.8
SAMPLE VAR.	0.0	0.0	0.0	0.1
TRANSFORM				
NO. OF ITEMS	1	0	42	25
AVERAGE CORRECT	91.3	0.0	74.5	66.5
SAMPLE VAR.	0.0	0.0	455.6	939.5
AV. COR. LATENCY	0.6	0.0	0.9	1.1
SAMPLE VAR.	0.0	0.0	0.1	0.1
TRANSFORM INFLECTION				
NO. OF ITEMS	6	1	213	44
AVERAGE CORRECT	95.6	91.3	78.7	78.8
SAMPLE VAR.	15.9	0.0	435.7	250.6
AV. COR. LATENCY	0.7	1.0	0.9	1.0
SAMPLE VAR.	0.0	0.0	0.1	0.3
INFLECT				
NO. OF ITEMS	33	1	578	207
AVERAGE CORRECT	96.8	78.3	85.6	82.7
SAMPLE VAR.	64.8	0.0	291.3	389.6
AV. COR. LATENCY	1.2	1.8	1.5	2.1
SAMPLE VAR.	0.5	0.0	0.6	1.3
TRANSLATE & INFLECT				
NO. OF ITEMS	3	0	195	77
AVERAGE CORRECT	91.2	0.0	74.7	71.3
SAMPLE VAR.	230.6	0.0	604.8	535.4
AV. COR. LATENCY	0.6	0.0	0.9	1.1
SAMPLE VAR.	0.0	0.0	0.1	0.5